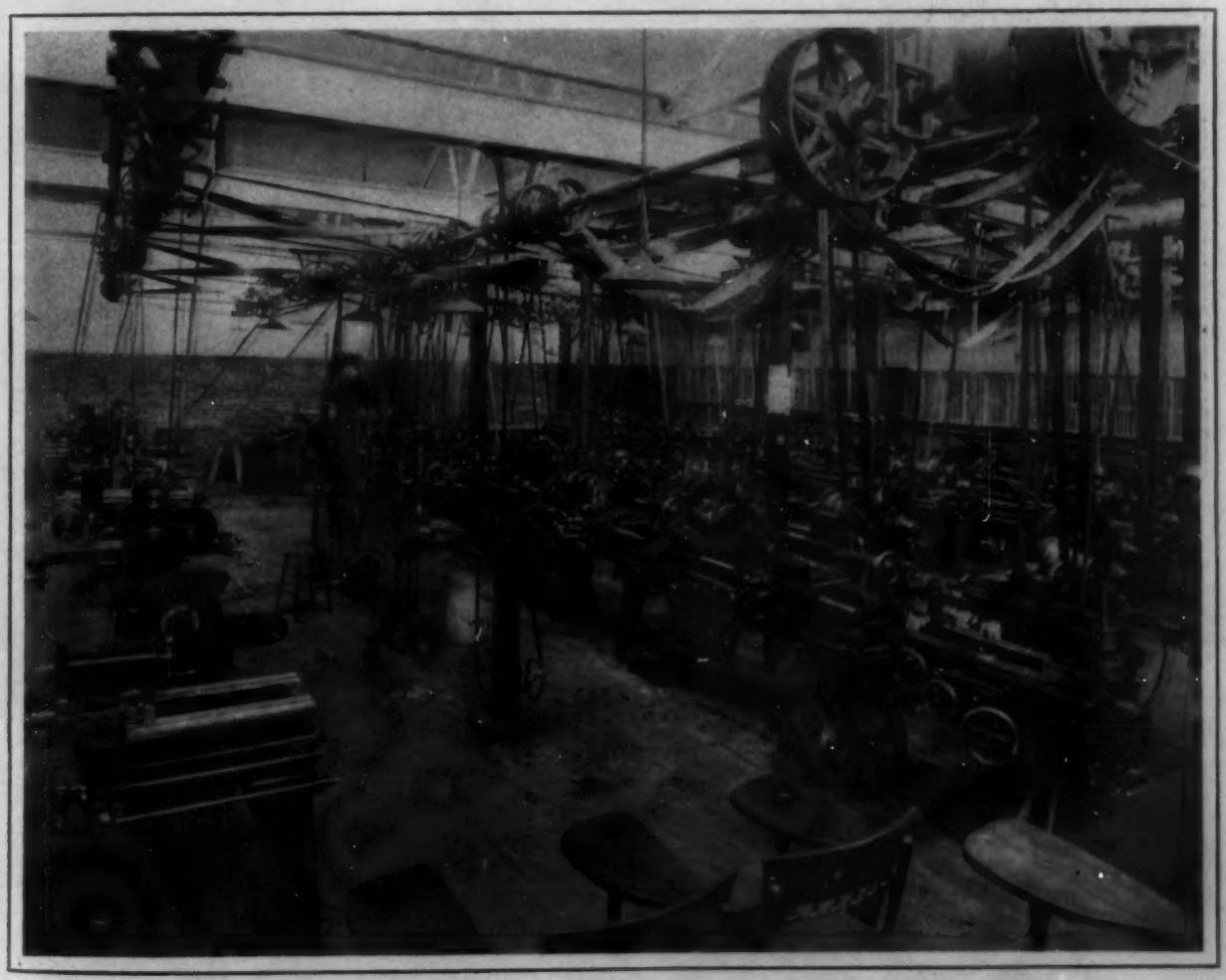
THE IRON AGE

Established 1855 New York, November 28, 1912 *Vol. 90: No. 22*

The Latest Technical High School

Cleveland Has Provided One Which Is Thoroughly Equipped, Is Manned by Shop-Trained Men and Aims at Practical Results

Whether the public high schools should continue to be conducted along the regular lines that have been long followed or whether they should be broadened to include practical technical training and offer inducements to the thousands of boys who leave school for work shops without entering the high school grades, has been much discussed among educators and others in the past few years. Regardless of the merits of the theoretical arguments, it appears that the question will be generally solved by the boys themselves; that when an opportunity is afforded them, they will show by their attendance that there is a large and growing demand for technical high schools. This has been illustrated early in the history of the technical high schools in Cleveland, Ohio, which may be regarded as a typical large city in which manufacturing industries predominate, widely diversified but largely along metal working lines, and in which there is a large percentage of children of foreign born parents. Many of these are forced to become bread winners at an early age and others leave school because they are not attracted by a high school academic course that does not fit them for the work they are to take up in the shops.



Advanced Machine Shop Showing in Foreground the Seats of the Raised Demonstration Platform

The first technical high school in Cleveland, known as the East Technical High School, was opened in 1910, being the outgrowth of an investigation conducted by an educational commission composed of representative citizens appointed by the president of the board of education. In a short time this school was overcrowded, the number of pupils enrolled reaching 1800 in 1911 and the present year. The school had scarcely been opened before the board of

S. DIESCHER & BROS.
Mech. and Civil Engineers,
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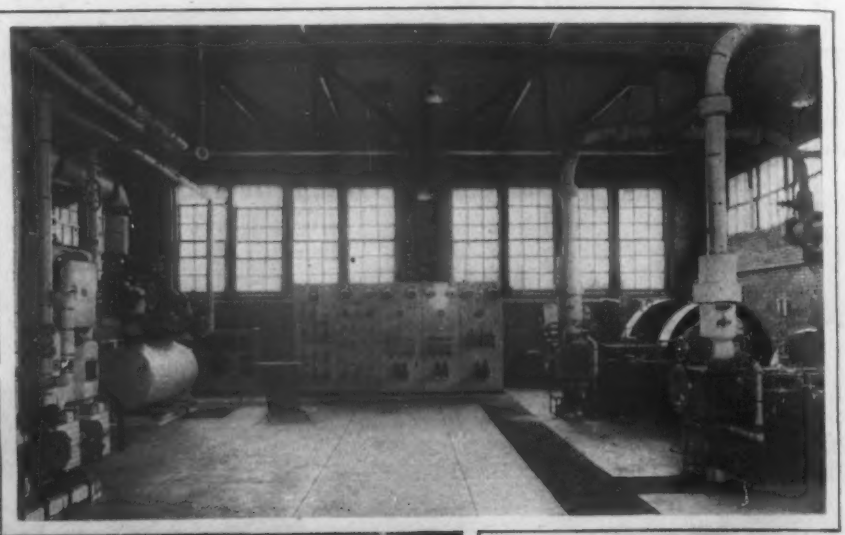
education, appreciating the great demand for the facilities afforded, began plans for a similar school on the opposite side of the city. This school, the West Technical High School, was partly completed last spring when 300 pupils were transferred to it from the East school, but the regular opening of all departments was deferred until the completion of the building in the early fall.

The Latest School of Its Class

Being the latest technical high school built the new school is said to be the most complete institution of its kind in the United States, as regards the design of the building itself, its equipment and arrangement and the advantages afforded for securing technical training. Before this school was built, R. L. Short, its principal, spent two years in studying its needs and laying out its plans, and during that time he visited many of the technical schools in England and Germany as well as in this country to get new ideas as to the arrangement of the building, needed equipment and the method of teaching, in order to profit by the experience of other cities. In planning the building he had the able co-operation of F. S. Barnum, the Cleveland school architect.



Part of the Power Plant

The Foundry

The Pattern-Making Shop

The most important aims of this school are to prepare the youth of both sexes for a definite vocation and for efficient industrial citizenship, and to help men and women already engaged in a vocation to better their condition by increasing their technical knowledge and skill. The school also offers to those who may desire to pursue their studies still further an opportunity for entrance to technical schools of college rank. It is the aim to make the instruction as practical as possible. With that end in view each one of the 24 instructors has had large practical experience in the work that he teaches. No instructor is engaged, no matter how well qualified by education and previous experience in teaching, who has not also done practical work either as a foreman or in some other position where it has been part of his duty to give instructions to those under him. Thus the teaching staff includes men who have been able foremen in some of the best managed machine shops.

Old Manual Training Ideas Find No Place

The school is conducted as far as possible away from the old manual training idea. Practical instruction is given from the start, so that if a boy leaves the school at the end of his first year, what he has received in that year gives him earning power. It is claimed that by taking the complete course a boy will save two or three years that he would otherwise spend as an apprentice and at the same time will get the thorough general education that will help him to become an all around mechanic—such practical education as is impossible for him to secure while learning a trade in the ordinary way in the specialized work of an ordinary shop.

School Terms and Courses

The school is in session the entire year, which is divided into four terms of 12 weeks each. To graduate, a pupil must complete 12 terms of work, covering a specified number of hours. This work may be taken continuously or by terms which suit the convenience of the pupil. If it is taken continuously, the four years' course may be com-

pleted in three calendar years. The school is in continuous session from 8:30 a.m. until 3:30 p.m. five days a week, this time being divided into nine equal periods. At noon the pupils are given time for luncheon in the building.

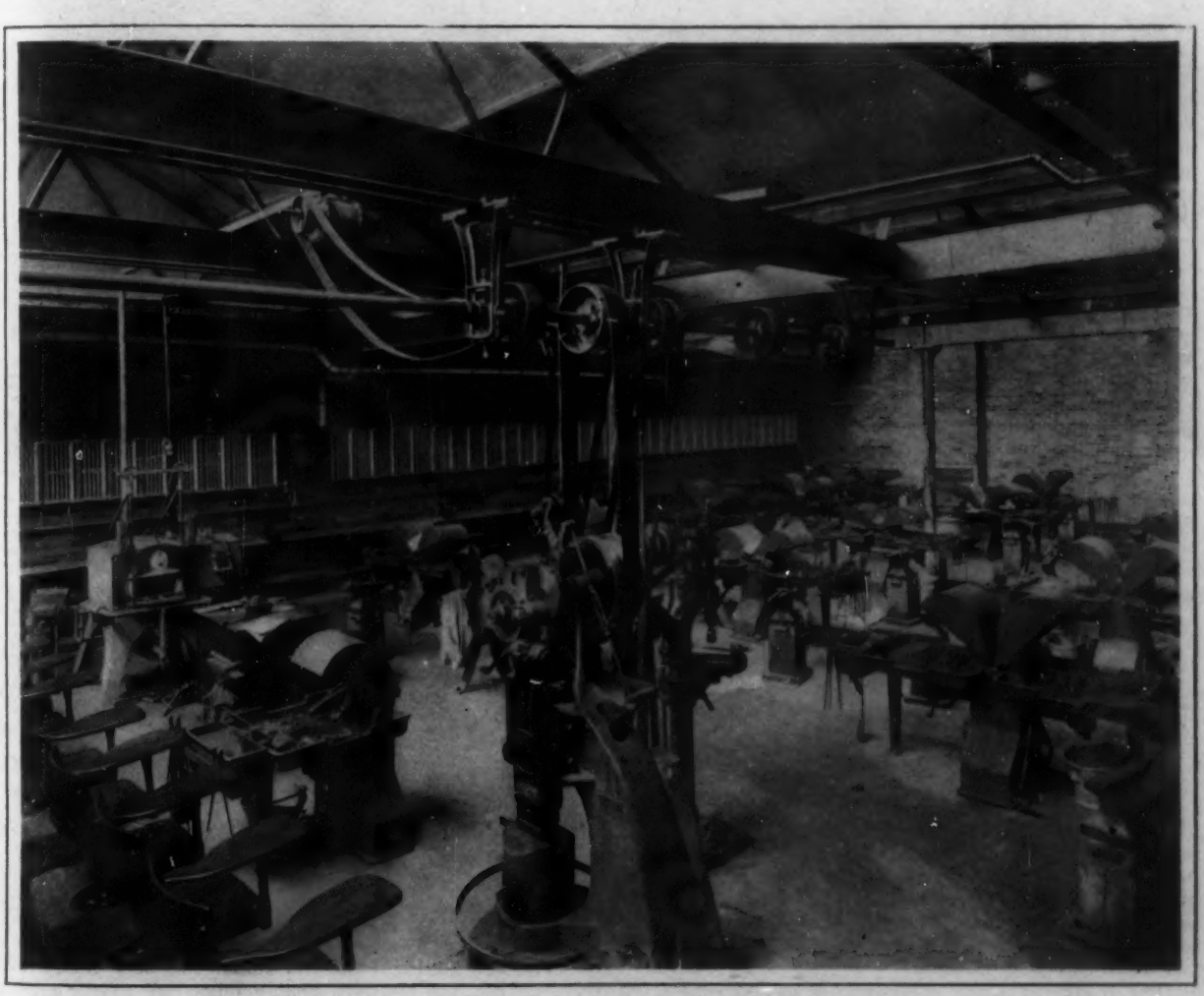
In addition to the regular day school an important and original feature of the institution is a night vocational school which is conducted along continuation school lines for apprentices, journeymen and others who are employed during the day. The night school session is from 5 to 9 o'clock. The various night school classes are so arranged that they can either be co-operative or otherwise. No academic instruction is given the night classes, the time being spent in special technical work. The night courses of instruction include mechanical, architectural, structural, pattern making and perspective drawing, reading of blue prints, machine design, pattern making, foundry practice, forging, machine tool practice, electrical construction, electric automobile repair and shop mechanics. Courses of 20 lessons are given in each of the above subjects, a nominal charge of $5 being made for each complete course. Two lessons covering a period of two hours each are scheduled per week on each subject. A minimum registration of 12 persons is required for the formation of a class in any subject. The technical courses of night instruction are designed to give the student a thorough training in the fundamental principles of drafting and shop practice.

The only co-operative course so far established is an extension course for printers. This night class is composed of 65 apprentices and journeymen printers who are sent to the school by the master printers, their instruction being paid for by the Master Printers' Association. An interesting fact is that this course received official approval from the printers' union. As fast as other employers agree to co-operate, other classes will be formed of employees engaged in various trades.

The regular day school course is divided into academic and technical work. The latter includes drawing in practically all of its branches; there are advanced courses in machine design and structural drawing, pattern making, foundry, forge and machine shop work, electrical construction and physical and chemical laboratory work. The rooms for practical instruction include three pattern shops 40 x 40 ft., foundry 40 x 48 ft., two machine shops, one 52 x 48 ft. and one 56 x 44 ft., forge shop 62 x 40 ft., electrical construction room, cabinet shop, four drawing rooms, print shop, and one physical, two chemical and one geographical laboratories. Pupils are given instruction in classes of 28, each shop having a raised demonstration platform with seats for that number. In front of each platform is located a machine most frequently used in that shop. Each shop is provided with a blackboard for use in instruction work.

Unusual Amount of Mechanical Equipment

The mechanical equipment in the various shops is very complete. Of $100,000 expended for teaching equipment, $30,000 was used for machinery that is installed in the machine shops and $10,000 for laboratory equipment. In the machine and forge shop there are 100 machines in addition to a large amount of small tool equipment. In the elementary machine shop there are 23 engine lathes, six speed lathes, three shapers and two drill presses. The advanced machine shop equipment includes 25 engine lathes, four milling machines, two shapers, an automatic screw machine, two grinding machines, a planer and various small equipment, including drills, arbor presses, etc. The foundry has a 24-in. cupola, tumbling barrel, core oven, brass furnace, 24 molder's benches and such small tools as are needed. The forge shop is provided with 29 down draft forges, tempering furnace, power hammer for illustrating drop forging, power shears, hack saws, emery wheels and drills. A mill room is equipped with machinery to re-saw and prepare lumber for use in the various shops. In the shops is a liberal amount of bench space for bench work. The drafting rooms are models of their kind. Each



Forge Shop of the Cleveland West Technical High School

pupil has his individual instruments which belong to the school. The electrical construction department is provided with dynamos, generators, induction motors, testing machines, both speed and resistance, and small tools needed for wiring and repair work. This room is fitted up with 28 miniature rooms in which pupils may work out the various problems assigned to them. The chemical laboratories are thoroughly equipped for both elementary and advanced work. They are provided with 28 individual desks, each of which has hot and cold water, gas and electricity. The course of general chemistry is followed by the study of the chemistry of iron and steel and various manufactured products. The physics laboratory is fitted with equipment for the study of machines and electricity, to which this department is largely devoted.

The Pupil's Technical Work

The technical training of the boy starts with pattern making, drawing and elementary pattern making. In the third term foundry work is added. Forge-shop instruction as well as a course in cabinet making are given in the second year. The courses are arranged so that the pupils may specialize the last two years, devoting as much as 20 hrs. a week in the machine shops on some special lines of work. As far as possible the pupil designs what he is to make in the shop. Starting with drawing in the first year he draws a pattern, makes a pattern from the drawing and when a little further advanced makes a casting from the pattern. The casting is machined by advanced pupils in the machine shop.

In the elementary machine shop the pupil is taught to file, turn tapers, cut threads and finish work from the foundry and forge rooms. In this shop the lathes are all the same type so that the instructors can teach the general principles of engine lathe without loss of time and danger to the pupils. In the advanced machine shops the fourth-year pupils do special work, design and make lathes, build gas engines, electric motors and vacuum cleaners, and study tool making, etc. Most of the standard makes of machinery are to be found in this shop, so that the pupils are given a chance to become familiar with the different types before securing employment in a regular machine shop.

In the forge shop the pupil is given nine weeks of work in iron and nine in steel. In iron he learns to form to dimensions chains, hooks, cold chisels and some ornamental work such as hinges, escutcheons, door knobs, etc. In steel he makes cutting tools for the machine shop and wrenches. In the machine shops the pupil is taught accuracy, good design and speed, being required to develop the speed demanded in shop practice.

Each Boy's Teacher Made His Individual Adviser

Throughout the school close relationship is maintained between the pupil and the teacher. When a boy enters he is assigned to a teacher who is to be his adviser as long as he is a pupil. The teacher visits his home, becomes acquainted with his surroundings, talks over his future and virtually becomes the boy's mentor, responsible for his attendance, scholarship and course of study and gives advice as to choice of vocation.

The course of study in general is as follows: First year—English, mathematics, industrial geography, mathematical drawing, pattern work and physical training. Second year—English, mathematics, chemistry, mechanical drawing, shop work and physical training. Third year—English, physics, German or French or industrial history or technical, mechanical drawing, shop work and elective technical. Fourth year—Advanced mathematics, American history and civics, German or French or elective academic or technical, and elective technical.

On the theory that physical training is essential to sound scholarship, all first and second year students are required to take a course in physical training which includes lectures on personal hygiene, physiology of exercise and kindred subjects. The boys undergo a thoroughly physical examination and are given individual advice to assist them in acquiring and maintaining healthy bodies.

This outline of the work of the school does not include the instruction for girls, which in addition to academic lines, consists of cooking and other branches of domestic science, sewing and applied arts which include dressmaking and millinery. A café is maintained in the building in which pupils may obtain lunches and supper at cost. The meals are prepared largely by the girl pupils who also do the serving and cleaning up.

Details of the Building

The school building is of the most modern design. It is a handsome structure of shale brick, gray stone and terra cotta. The windows occupy a large part of the wall space, providing an abundance of light. There are four stories, a basement and sub-basement in the center portion and the remainder is three stories above the basement. The building provides four acres of floor space and there are 98 rooms. The drafting rooms are on the first floor and various shops are in the basement. The third floor is used mostly for laboratories. The remainder of the building is taken up with lecture, recitation and study rooms, auditoriums, library, gymnasium, etc. Steel lockers throughout the building take the place of cloak rooms. Dressing rooms and lavatories with hot and cold water are conveniently located and ample shower bath facilities are provided.

A great deal of attention was given to the heating, lighting and ventilating of the building. It is customary to furnish a fresh air supply of 30 cu. ft. per minute per person, but in this building the air supply has been increased to 50 cu. ft. per minute in the class rooms and 75 cu. ft. in the laboratories. A fan heating system distributes 171,000 cu. ft. of tempered air per minute throughout the building. The air is moistened by live steam after being heated and the humidity is under automatic control. Foul air is taken out by exhaust fans. Steam heat is also provided in all the rooms. Outside light is admitted to the shop rooms and the drafting rooms from above through skylights. Light is admitted to the foundry from side windows. Indirect electric lighting is provided in all the drafting rooms. In all the rooms outside of the work rooms unusual attention has been paid to the color scheme, this covering the trimmings, wall decorations, etc.

A complete power plant is operated in connection with the school for furnishing light, heat and ventilation and power for driving the machinery and operating the elevator. There are four 150-hp. boilers in two batteries, two 185-hp. engines direct connected to 125-kw. generators and an 80-hp. engine connected to a 50-kw. generator.

The building occupies a 6-acre site, 3 acres of which is devoted to experimental gardens in connection with which there is a large green-house. There is an athletic field with a quarter mile track, base-ball diamond, foot-ball gridiron, tennis courts, a grandstand seating 2000 and an outdoor gymnasium. This gymnasium is unique in construction and is said to be the only outdoor gymnasium in the country. It consists of a wood roof supported by large concrete columns and is inclosed by a wire netting and has a clear floor space of 49 x 90 ft.

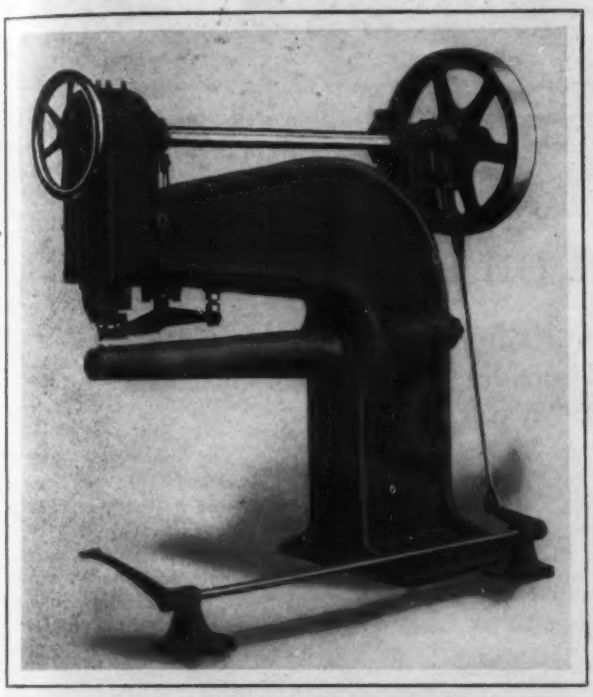
The school accommodates 1200 pupils. It now has 500 in both the day and night classes and it is expected to be filled up to its maximum capacity in a few weeks.

Kissel Motor Car Company's Boston Station

The new Boston KisselKar station has been completed and opened for business, adding one more to the chain of model service buildings which are being erected throughout the country for the patrons of the Kissel Motor Car Company, Hartford, Wis. The Boston building, which is located at 1030 Commonwealth avenue, is of reinforced concrete, 74 x 200 ft., two stories. The first floor front is used for the salesroom and private offices. The salesroom is 74 ft. wide and 70 ft. deep. In the balcony overlooking the salesroom are located the general offices, stockroom and vaults. In the rear is a perfectly equipped garage, among its fittings being an elevator 10 x 28 ft., one of the largest ever built. A turntable to facilitate the handling of cars is a prominent feature. Adjoining the garage is a commodious and comfortable restroom for chauffeurs. The second floor is devoted to commercial delivery wagons and trucks, roomy exhibition space being set aside for this purpose. In the rear is the repair shop, which has been equipped with every conceivable mechanical device for speedy and thorough work. KisselKar buildings of similar appointments, though of different design, have been open for some time in Minneapolis and Milwaukee, and work is being rushed on the Chicago and St. Paul stations.

Press for Punching and Riveting Metal Pipe

The Niagara Machine & Tool Works, 639 Northland avenue, Buffalo, N. Y., has recently designed a machine for handling the punching and riveting work in connection with the manufacture of metal pipe, culverts, etc. Two operations are performed simultaneously, two thicknesses of metal being punched, while a rivet inserted in the hole punched in the previous stroke is being headed. The rivet is inserted with the head upward and the combining of punching and riveting in a single operation can be applied where the rivets are uniformly spaced from 1 5/16 to 2¾ in. apart.



A Press for Handling the Punching and Riveting Work in Connection with the Manufacture of Metal Pipes, Culverts, Etc., Built by the Niagara Machine & Tool Works, Buffalo, N. Y.

The rivet header and punch are mounted in adjustable holders which are fastened to separate slides which are actuated by two eccentrics and pitmans from the main shaft. If preferred the machine can be used for punching holes only, for riveting only, or for punching and riveting alternately. When riveting is to be performed the hole punch can be quickly put out of action and when it is desired to punch without riveting the rivet punch runs idly. A cam-actuated stripper or holddown clinches the material while it is being operated upon, and strips the stock from the punch at the upstroke.

The press has an automatic jaw clutch and the motion of the slides can be controlled either by a hand lever or a foot treadle. As long as pressure is maintained on one of these the slides will operate continuously, but as soon as the lever and treadle are released the slides will stop automatically at the upper end of the stroke.

The depth of throat of the machine is 36 in. and the horn, which is of forged steel, is 5 in. in diameter at the outer end and 7 in. at the inner one. The press will upset cold rivets up to a maximum diameter of ¼ in. and it will punch a ⅜-in. hole through a piece of iron ¼ in. thick, or its equivalent. The approximate weight of the machine is 3600 lb.

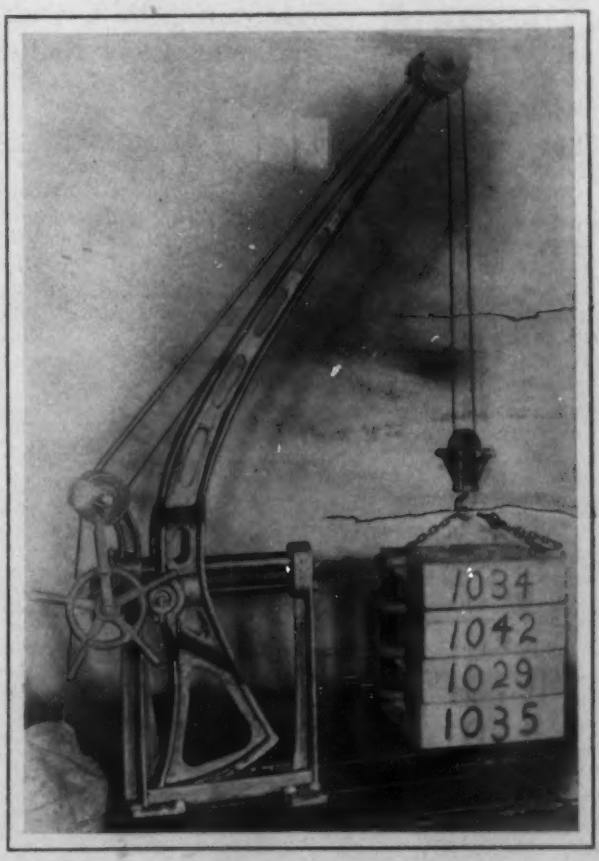
The C. C. Knight Company, Philadelphia, Pa., which for many years has been engaged in the merchant iron and steel business and recently located at Sixteenth and Callowhill streets, has discontinued business. A sale of the stock and equipment of the company was made November 25, by Barnes & Loflan, auctioneers.

W. N. Matthews & Brother, manufacturers of patented electric service specialties, 3722 Forest Park boulevard, St. Louis, Mo., are now represented on the Pacific coast by L. E. Sperry, San Francisco; B. C. Chase, Los Angeles, and H. G. Behneman, Seattle, all succeeding the John R. Cole Company.

A Small Capacity Compensated Quadrant Crane

For use on trucks where horizontal swinging is not required, the LaSalle Machine & Tool Company, LaSalle, Ill., is building a 1-ton compensated quadrant crane. Although this crane is not made with a turntable, one can be provided so that the crane can be operated through 180 deg. or the entire circumference of a circle. The compensating feature of the crane, it is emphasized, enables the crane to be operated with only a slight thrust on the screw and also enables the load to be kept at the same hight regardless of the position of the boom. The hoisting is accomplished either by an electric hoist on an electric truck or by one designed to be driven directly from the transmission of a gasoline truck.

Open-hearth steel castings are used for the frame, the boom and the nut of the crane and the tierod upon which the last slides is made of cold rolled steel and covered with brass tubing. To avoid corrosion, nickel steel is employed for the screw, which is mounted upon self-aligning radial and thrust ball bearings. Phosphor bronze is used for lining the nut. The screw is actuated by a crank through gun metal bevel gears having a ratio of 1½ to 1 and it is pointed out that it is possible for a man to raise the boom from the lowest to the highest position in 30 sec. The thrust on the screw is said to be very slight on account of the compensating feature of the crane and in some positions the boom is practically balanced.



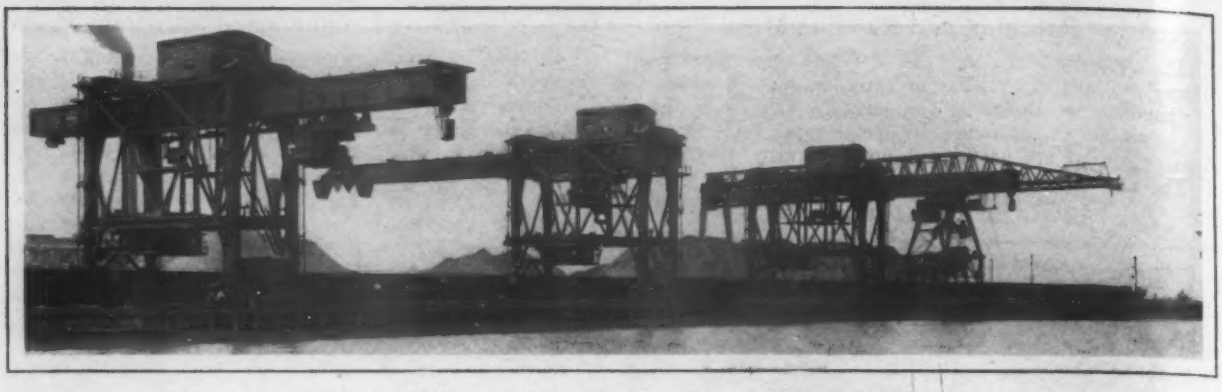
A New Design of 1-Ton Compensated Quadrant Crane Built by the La Salle Machine & Tool Company, La Salle, Ill.

The following table gives the principal dimensions and specifications of the crane:

Maximum reach, ft	7
Minimum reach, ft	2
Maximum hight, in	118
Minimum hight, in	74
Weight, lb	1,150

The figures upon the weights in the accompanying engraving show one load with which this crane was tested and it is stated that by attaching a crank to the pilot wheel it was possible for one man to raise the boom with the test load attached from the lowest to the highest position without any trouble.

The Reeves Mfg. Company is installing a 126-in. shear in its sheet mills at Canal Dover, Ohio.



View of the Three Unloaders Showing Them in Various Positions

Ore Unloading Plant on a Curved Dock

The Baltimore & Ohio Railroad Plant at Lorain, Ohio, with Unloading Machines Having Long Ram-Like Water Overhangs

A new ore unloading plant recently installed for the Baltimore & Ohio Railroad Company at Lorain, Ohio. by the Brown Hoisting Machinery Company, Cleveland, Ohio, is of interest for the reason that the equipment represents a new type of Brownhoist conveyer that was designed to meet unusual conditions that were brought about by the topography of the site. Previously all plants for unloading ore from boats had been built along straight docks. The site of this plant is located on a bend in the Black River, so that it was necessary to construct the dock with a radius of curvature of 1432.7 ft., and a novel feature of this plant is that the tracks on which the unloading and handling machines travel have of necessity the same curvature.

Not only was it necessary to design to handle equipment on curved tracks, but a radical departure was made from the previously designed Brownhoist plants to provide equipment to fit the needs of the site. When one of the long ore boats now in use on the Lakes is tied up to a curved dock the hatches at either end are a considerable distance from the dock because of the bend in the river. This necessitates unloaders with arms that would reach out further over the water than required in ordinary ore handling plants. To meet this condition the unloaders were designed with movable rams having a runway for the trolley and bucket. These rams, which have a travel of 71 ft., take the place of stationary mast-supported runways in previously erected Brownhoist fast ore plants.

The plant consists of three Brownhoist ram fast plants and one Brownhoist bridge tramway. The three fast plant unloaders remove the ore from boats and deliver it to railroad cars or to the stock pile behind the unloaders, from which it is handled by the bridge tramway. When the ore is delivered directly to the cars it first passes through a movable weighing hopper with a capacity of 70 tons, which is located on the portal pier of the fast plant. The three unloaders will completely unload a modern 12-ft. center hatch 10,000-ton vessel in 10 hr., and when breaking into fresh hatches each of the three unloaders will handle from 500 to 550 gross tons per hour.

When the ore is being stored instead of loaded directly on cars it is placed by the unloaders on the stock pile behind the unloading plants. The bridge tramway transfers it from this stock pile to a large storage place beneath the bridge, which has a handling capacity of from 600 to 650 tons per hour. When the ore is to be shipped from this large stock pile it is transferred from the bridge to railroad cars beneath the portal pier of the bridge. It first passes through a fixed weighing hopper of 70 tons capacity, which gives the total weight of all ore loaded.

The dock covered by the unloaders is 850 ft. in length and is 5 ft. above the water level. The front tracks for the unloaders are laid 5 ft. back from the edge of the dock. The unloaders travel on two lines of track spaced 62 ft. 10 in. between centers, each line of track consisting of two T rails spaced 2 ft. center to center.

The unloader consists of a portal pier on which is supported a movable ram that travels back and forth at right angles to the face of the dock. The ram is equipped with an electric man trolley carrying a 145-cu. ft. Brownhoist ore grab bucket with a capacity of 9 tons. The man trolley is equipped with a cage for the operator, which contains all the switches and levers for operating the plant.

The portal pier is mounted on four double rail-equalizing trucks, each supported on eight single flanged truck wheels and spans four standard gauge railroad tracks. The pier is propelled along the face of the dock by motors with shafting and a train of gears. The ram consists of parallel plate girders spaced 10 ft. 1 in. center to center with the necessary braces. The ram is supported at each of the four corners of the pier on four wheels under the lower flange and by a pair of wheels above the upper flange. In addition the ram is held sidewise against wind pressure by horizontal guide wheels, two at each of the four corners. The travel of the ram back and forth on the pier structure is effected by wire ropes attached to a motor-driven drum placed in the small machine house on the top of the pier, the ropes running out to the back of the ram and passing over pulleys, one on each side. The ram is moved back and forth by operating the drum in one or the other direction.

The man trolley with which the runway of the ram is fitted travels under its own power, carrying the grab bucket. The trolley is so designed that the operator can turn the bucket through an angle of 90 deg. by a turntable upon which the bucket is suspended. The total travel of the trolley on the ram is 143 ft., which, with the ram travel of 71 ft., makes a total operating distance of 214 ft. for the trolley. The switches are so set that when the trolley is traveling in a certain direction the ram will move in the same direction at whatever speed is desired or the switches can be thrown so as to hold the ram stationary.

A movable weighing hopper is placed on the portal pier and travels on runways supported by the pier structure, which makes it possible to load cars on any of the four tracks. The travel of the hopper is effected by wire ropes and a motor-driven drum similar to the method of propelling the ram. The hopper is operated independently of the rest of the machine and is equipped with an operator's cab in which all the switches and operating levers and the scale beam are located. The hopper is fitted with two undercut gates operated by motors and the necessary mechanism.

The entire plant has a travel speed along the dock of 75 to 100 ft. per minute. The hoisting speed of the bucket when loaded is 200 ft. per minute and the trolley travel along the runway is from 600 to 700 ft. per minute. The

ram travels back and forth at 300 ft. per minute. The speed of the weighing hopper along its runway is 125 ft. per minute.

The unloader, with the exception of the weighing bin, is entirely under the control of the operator on the main trolley, all the switches, controllers, levers, as well as all brakes, being accessible to the operator. The machine is so designed that when no current is passing through the motors the brakes are automatically set and the entire machine is locked.

The tracks on which the bridge tramway runs are laid some distance behind those for the unloaders and are erected on concrete foundations with the same curvature as that of the dock. The distance between the pier of the unloader and the pier of the bridge is 147 ft. 5 in., center to center. The bridge consists of a portal pier at the front and a shear leg in the rear, the distance between their centers being 250 ft. 3 in. There is a cantilever projection 142 ft. 9 in. long at the pier end which extends over the stock pile behind the unloaders. This makes the total length of the bridge 393 ft. The bridge is so designed that a cantilever 160 ft. in length can be erected at the rear end whenever desired.

The portal pier of the bridge runs upon two lines of track spaced 33 ft. 6 in. center to center and each track consists of two rails spaced 30 in. The bridge pier is carried on four double rail equalizing trucks, each supported on four single flanged wheels and spans two railroad tracks. The fixed weighing hopper, which is placed on the pier and directly over the railroad tracks, is fitted with two motor-operated gates so arranged as to discharge the ore into cars on either of the two tracks. The operator's house in which are the scale beam and the bin operating mechanism is placed on the bin.

The bridge shear leg is of A-frame construction mounted on two double-rail equalizing trucks, each truck being equipped with eight single flanged wheels. The leg is of open construction, so as to allow the trolley and bucket to pass through it. The motors for operating the bridge are placed at each end, one being over the shear leg and one on top of the portal pier. The power is transmitted from the motors to the truck wheels through shafting and a train of gears. The bridge span is connected to the pier by a pivoted connection supported on roller rests and to the shear leg by a ball and socket connection designed so as to allow the bridge to skew in either direction. A safety switch is applied and cuts off the current when the bridge has skewed a certain amount. There is also an automatic indicating device placed in view of the operator to let him know when there is any undue skewing.

The bridge trolley travels on a runway placed underneath the bridge span, and has a maximum travel of 364 ft. 9 in. The operator of the trolley has entire control of the bridge, running the trolley back and forth, hoisting and dumping the load and propelling the bridge along its tracks. The trolley is equipped with a 150-cu. ft. grab bucket having a capacity of 10 tons. The hoisting speed of the bucket when loaded is 225 ft. per minute and the trolley travel along the bridge is 1000 ft. per minute. The travel of the bridge with a full load is from 60 to 80 ft. per minute.

The bridge is equipped with all necessary brakes, controllers and switches. The trolley is equipped with a powerful foot brake which controls its travel along the bridge. The entire plant is equipped with brakes which are automatically set when no current is passing through the motors. The power for the unloaders and the bridge is taken by collector shoes from a power rail which runs along the tracks. The current is taken from the collector shoes to the motors by weatherproof insulated wire attached to the structural work by standard insulators.

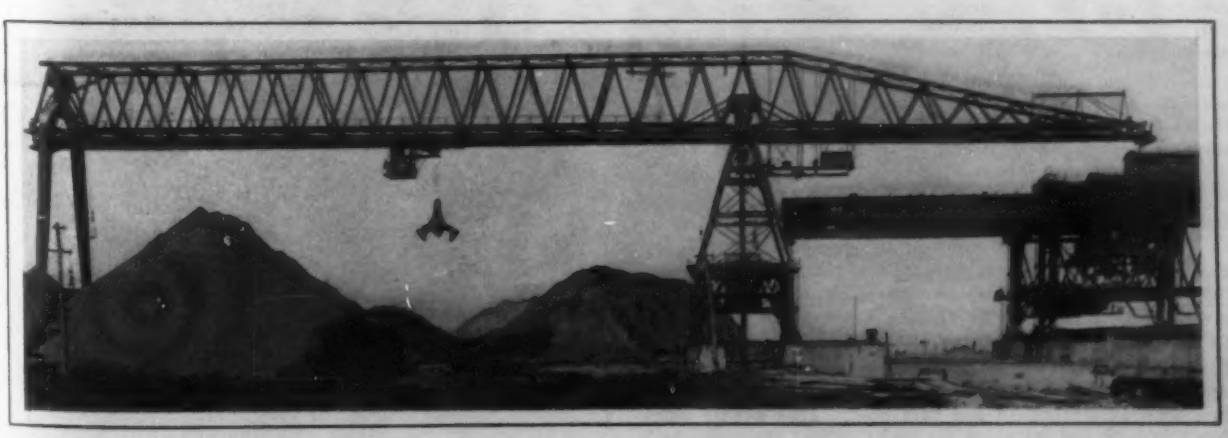
All of the electrical equipment is designed for a direct current of 220 volts. The motor equipment consists of the following: one 100-hp. motor for traveling the fast plants, one 100-hp. motor for traveling the ram backward and forward, one 350-hp. motor for hoisting, one 75-hp. special railway type motor for racking the trolley, one 5-hp. motor for operating the turntable on the trolley, one 25-hp. railway type motor for operating the gates of the movable hopper, one 15-hp. motor for racking the hopper, two 50-hp. motors for the bridge travel, one 225-hp. motor for the bridge hoisting mechanism, one 225-hp. motor for racking the bridge trolley and one 25-hp. motor for operating the gates of the bridge-weighing hopper.

Programme for Industrial Education Meeting

The National Society for the Promotion of Industrial Education will hold its annual meeting this year, the sixth, in Philadelphia, December 5, 6 and 7. Among the subjects to be discussed are: Present tendencies in vocational education; teachers for boys' work, to be discussed in part by F. W. Thomas, supervisor of apprentices, Atchison, Topeka & Santa Fé Railroad, Topeka, Kan.; a symposium on Federal aid for vocational education, to be made a feature of a banquet on the evening of December 5, and what the manufacturer can do to get team play between the schoolmaster and the layman, by Fred A. Geier, president Cincinnati Milling Machine Company, Cincinnati.

The Philadelphia committee for the convention is headed by Justus H. Schwacke, manager and secretary William Sellers & Co., and toastmaster for the banquet. Among members of the convention committee are Morris L. Cooke, director of public works, Philadelphia; Samuel T. Bodine, president United Gas Improvement Company; James Mapes Dodge, Link-Belt Company; Henry Hess, former president Hess-Bright Mfg. Company; Alba B. Johnson, president Baldwin Locomotive Works, and Fred W. Taylor. Congressman William C. Redfield, vice-president American Blower Company, is president of the society and C. A. Prosser, 105 East Twenty-second street, New York, is secretary.

The Union Mfg. Company, maker of lathe drill and planer chucks, New Britain, Conn., has taken over the manufacture of a hand operated punch, shear and rod cutting machine formerly made by P. G. H. Bennett & Co., Boston. This will be made in three sizes. It is intended for general use in machine shops, blacksmith shops, garages, etc., for wire and rod cutting, shearing bars and plates, and punching holes. No new equipment will be required.



New Lora'n Ore Unloading Plant of the Baltimore & Ohio Railroad Installed by the Brown Hoisting Machinery Company, Cleveland, Ohio

A New Horizontal Crude Oil Engine

A Single-Acting Prime Mover of the Diesel Type to Use Heavy Oil

Crude oil and also the residual products obtained in the refining of crude oil together with the by-products of coke and gas manufacturing plants can be utilized as fuel in the new horizontal internal combustion engine that has been brought out by the Otto Gas Engine Works, Philadelphia, Pa. The engine is of the single-acting type and operates on the Otto four-cycle principle and makes use of the Diesel method of fuel injection and combustion. The special advantage of this type of engine is said to be due to a new principle of handling low degree liquid fuels which have not heretofore been converted into power without the use of expensive and complicated auxiliary vaporizing apparatus. These fuels are used in this engine in the simplest and most generally available form and the engine is said to develop a brake horsepower hour on 1/15 gal. at a fuel cost of from 1/6 to ¼ cents per brake horsepower per hour. Fig. 1 is a view of the engine while the arrangement of the fuel and air injection mechanism is clearly brought out in Fig. 2.

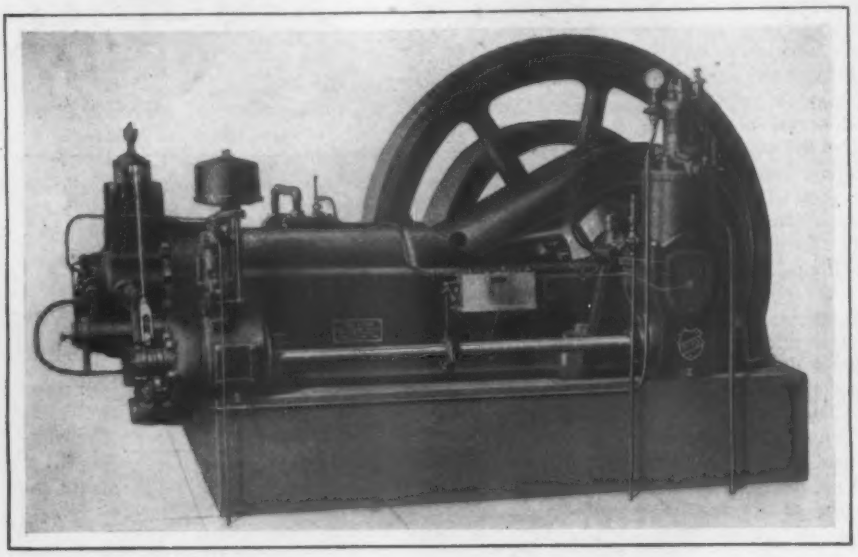


Fig. 1—The New Horizontal Crude Oil Engine Built by the Otto Gas Engine Works, Philadelphia, Pa.

In starting the engine, compressed air at a pressure of 180 to 200 lb. per square inch is utilized. This air is drawn from a small storage tank which is filled from the low-pressure stage of an air compressor. The air at low pressure is admitted to the cylinder through an air-starting valve which is thrown out of engagement when the engine begins to operate on its regular cycle. Simultaneously with the throwing out of play of this valve the fuel needle valve is dropped into place where it can be actuated by a cam and fuel is immediately injected into the combustion chamber. The engine is thus easily started by one man and it is emphasized that after it is in motion it requires no greater amount of attention than the ordinary type of gas or gasoline engine. Removing a pin which disconnects the fuel pump stops the engine easily.

The engine is fitted with a camshaft running parallel with the axis of the cylinder and upon it are mounted the cams which operate the air inlet, the exhaust, the air starting and the fuel needle valves and the fuel pump. The arrangement of these cams and valves is shown in Fig. 2. Spiral gears running in oil operate the governor from this shaft.

The design of the combustion chamber of this engine is said to be very simple and a reliable and efficient method of fuel injection is used. A two-armed lever operated by a cam on the camshaft opens the fuel needle valve at the proper time and the fuel is injected into the engine in a direction parallel to the bore of the cylinder, its direction being changed from one of right angles to this axis by a bend in the fuel port. This needle valve controls both the injection air and the port through which the pump delivers the charge of oil. Oil is discharged by this fuel pump only when the fuel needle valve is open, and the amount varies with the load on the engine.

The cam on the camshaft whch operates the fuel pump raises the pump plunger against the pressure of a heavy coil spring which at the end of the stroke forces the plunger down to follow the outline of the cam. The speed of the engine is maintained constant by the action of the high speed centrifugal governor, which acts on the fuel pump to vary the amount of oil passed to the fuel needle valve. This variation which is in proportion to the load on the engine is accomplished by the opening and closing of a by-pass connection which allows part of the oil forced in by the fuel pump to be returned to the tank.

The compressed air required for injecting the fuel into the combustion chamber is produced by a two-stage air compressor which forms an integral part of the engine and is driven by a small crank on the end of the crankshaft. Between the two stages the air is cooled in a vessel which is concentric with the compressor and is delivered directly from the high-stage cylinder of the compressor to the fuel needle valve, thus doing away with a high-pressure receiver. This arrangement, it is pointed out, is especially desirable in starting the engine as it enables high-pressure air to be deliverd to the fuel needle valve immediately.

The cycle of operation of the engine is as follows: During the first outward stroke of the piston a charge of pure air is drawn into the cylinder through the air inlet valve and on the succeeding inward stroke this air is compressed to such a degree that its temperature is higher than the ignition temperature of the heaviest oils. At the end of the stroke the fuel is injected into the cylinder and ignites at once from the temperature of the highly heated air, burning steadily for a part of the expansion stroke which is the next outward stroke of the piston. On the next inward stroke, whch completes the cycle, the burnt gases are expelled through the exhaust valve and it is emphasized that sudden variations in pressure are avoided in this engine.

The fuel consumption of the engine when using fuel oils of the average heating value, about 18,000 B.t.u. per pound per brake horsepower hour, has been shown to be

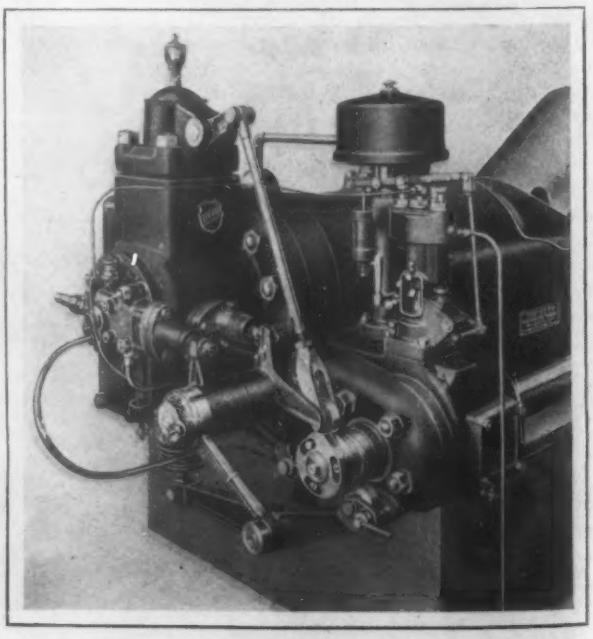


Fig. 2—View of the Cylinder End Showing the Arrangement of the Fuel and Air Injection Mechanism

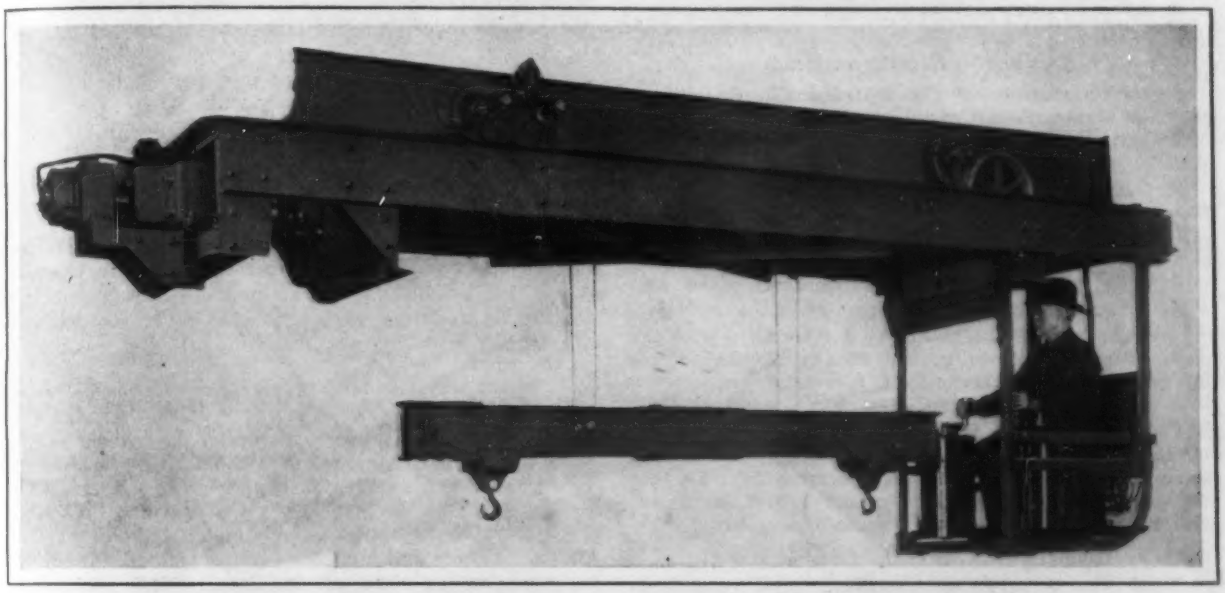
as follows: Full load, 0.50 lb.; ¾ load, 0.56 lb.; ½ load, 0.62 lb., and ¼ load, 0.74 lb. The variation in the speed of the engine between full load and no load does not exceed 6 to 8 r.p.m or less than 4 per cent. On special engines designed for use with electric generators the size and weight of the flywheel are so proportioned as to keep the cyclical speed variation within 3 per cent. of the mean rated speed with a gradual change of load.

A Double Hook Monorail Trolley Hoist

A special type of double hook trolley hoist for use on monorail systems has been recently built by the Northern Engineering Works, Detroit, Mich. This hoist is made in several sizes ranging in capacity from 2 to 5 tons, the smallest size being the one illustrated.

The trolley portion of the hoist which travels on the I-beam is the builder's patented construction and the current is secured from a set of steel conductor bars running alongside the track. The hoisting mechanism which consists of drums operated by individual motors is entirely inclosed. Cut steel gears are used and the bearings are of bronze. The hoisting speed varies from 30 to 75 ft. per minute, and the travel speed is approximately 200 ft. per minute. A dynamic brake is used in connection with the solenoid brake for controlling the position of the load while it is clear of the ground. The lower lifting beam is equipped with sliding hooks which can be adjusted at varying distances to accommodate the loads which are handled. The trolley wheels are swiveled to enable the machine to travel around curves and if the hoist is to be used for outdoor service the cab is inclosed with steel and is fitted with windows.

Although the hoist illustrated was designed for handling enameling tanks and is equipped with direct-current motors, alternating-current motors can be supplied and the hoist is equally well adapted for handling all kinds of freight, long steel bars, tubing, etc.



A Double Hook Monorail Trolley Hoist Recently Developed by the Northern Engineering Works, Detroit, Mich.

Stock-handling equipment is being installed at the Keystone furnace plant of the Reading Iron Company at Reading, Pa. The stock bins will be constructed of reinforced concrete similar to the bins at the Crumwold furnace of the company at Emaus, Pa. The work is being built under the designs and supervision of Frank C. Roberts & Co., Philadelphia.

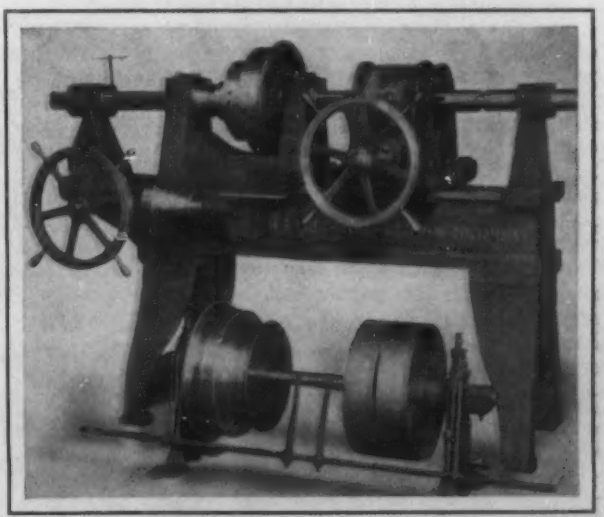
The Pennsylvania Railroad will shortly have available for use on the lines of its system a total of 2872 all-steel passenger cars, probably more than one-half of the all-steel passenger equipment in the United States, and representing an expenditure of approximately $40,000,000.

An Armature and Axle Bearing Boring Machine

Although designed primarily for boring the babbitted bearings of axles and armature shafts of the electric motors used in street railway service, the new machine of H. B. Underwood & Co., Philadelphia, Pa., is not entirely restricted to this work, as bearings for large pulleys, etc., can be bored equally as well. The points sought in the design of this machine were one that would turn out the work rapidly and would be suitable for quickly chucking and holding split bearings and could be operated by unskilled labor.

The handwheel at the right operates a powerful self-centering chuck which holds and centers split or round bearings ranging in external diameter from 4 to 12 in. in correct alignment with the boring bar. The cutting tool is held directly in the bar which is strong enough to use a single-ended cutter. To secure very accurate work on bearings of harder material than babbitt, an outboard support and an extension bar are provided. The headstock bearings are designed to compensate for wear without changing the spindle alignment and wide face pulleys enable large boring to be done without the use of gearing.

The bed of the machine is condensed as the feed mechanism is constructed to telescope under the headstock which forms a cover for the slide. The feed is automatic with three changes, and is controlled by hand with provision for a quick return of the spindle. If desired spiral oil grooves can be cut in the bearing after the box has been bored.



A Machine for Boring the Bearings for Motor Armatures Built by H. B. Underwood & Co., Philadelphia, Pa.

Selecting, Sorting, Treating and Paying Men*

Hints of an Experienced Works Manager Looking to the Development of the Able and Contented Working Force—Shop Thieving

BY STUART DEAN.

Surround yourself with capable men. It means more profit to your firm than any other item of the business. There is every argument in favor of employing only the best talent, and no argument against it. If you can get good enough men, you can afford to turn them out millionaires, as Marshall Field did his partners: he made millions doing it. Both Andrew Carnegie and John D. Rockefeller attribute their success to the fact that they surrounded themselves with very capable men. They have been preaching this to the American business man ever since. Surround yourself with the same kind of men they did.

Qualities in Department Heads

Don't be satisfied with the department heads until you get men that manage their departments better than you could yourself. With capable men around you, the work will be done easily, will be turned out cheaper and better, and the output of the factory will be increased. It will give you time to take up the big problems that spell profits. It is team work that builds up an establishment; you can't do all the work.

It is better to have a fine foreman even if he stays with you only a few years and gives you the trouble of breaking in a new one than to put up with a poor one just because you know he will stick with you forever. No matter what other quality a foreman lacks, he must not lack energy. A lazy foreman with brains will bring poorer results than a medium-brained foreman who has unlimited energy. The energetic man cannot put up with loafing or laziness; he does not understand it. The lazy foreman, in spite of himself, cannot help sympathizing with laziness. He knows the disease.

Giving Free Rein to the Capable Man

When you do get the exceptional good department head, gain his perfect confidence. Give him full sway; it is the only way to get the most from him. If you can see your way clear, never turn down any of his proposals. Let him carry his ideas out even though some seem impracticable. Giving a good man rope will stimulate him and bring great results. If you continually turn him down, he will give up proposing things. He will get out of the habit of scheming for better things. A very good thing may occur to him which he will not speak to you about because he is sure you will turn it down.

Be sure to have understudies coming along for every responsible and semi-responsible position. You are then perfectly guarded. Your work will always go smoothly.

Good workmen are not expensive when the value of their output is compared to the wages paid. The dollar paid in salary to the best man in the shop brings in a larger return to the firm than the dollar paid to the poor man. It is quite common to see the best man turn out double the output of the poor man, yet the best man will not receive double the wages that the poor man gets. There is about one good man in six. It certainly pays to worry through, trying the bad five, to get the sixth.

Fitting the Man to the Work

Don't try to make a man over into something that he is incapable of being. A man cannot change himself, as far as his character goes, more than 10 per cent.

Put on the physically and mentally fit man for each job. For very heavy work, where the output depends largely on the physical effort put forth by the workman, you must get a powerful man who has great endurance. The person with only average strength does not realize what powerful men there are in the world. They are by no means rare, either.

Continue trying new men until you surround yourself with geniuses in the line of work you want them to do. Don't be afraid of greenness. Greenness is the least of the faults in a man; it rapidly disappears.

Taking Men to Task for Mistakes

Never call down a man for breaking a machine, no matter how expensive the break may be, if it was done by forcing the work too hard. Better tell him that you are proud of him. He was showing the right spirit. Few men push the work to the limit. It is wrong to take the man to task who is really a rare article, a gem, because he was overzealous. This, of course, does not apply to the heavy-handed, careless man who breaks his machine by dropping something into the gears, or throws on the wrong feed by mistake. Even this man, if he be a big producer, should be dealt lightly with. If he is an habitual blunderer, get rid of him; he has an inaccurate mind.

Never continue to scold a man after he gets mad. Walk away from him until he cools down. Many a good employee has been lost by not knowing when to walk away.

After you give a man a raking down for something he has done, go back and brace him up with cheerful words. When you do this, he knows that your criticism was of his work, not of his ability. He knows that you are satisfied with him as a man; the criticism was purely of the work.

I have always found that more can be done by praise than by blame. Persuasive talk accomplishes much. Men who require a blowing up in order to keep them to the mark had better be dropped. Of course there is a difference in people; all cannot be handled alike. It is a good thing to give the foreman and sub-foreman a little talk, once in a while, such as "Let's all pitch in and pull together to make a fine showing. The selling department claims to be beating the manufacturing department." Make them feel that it is a game in which, to win, each one must push the work to the utmost.

Helping Employees in Trouble

Always help the workman when he is in trouble. When he gets hurt give him half pay. At such a time he needs the money desperately, and the outlay is but a slight item in the general expenses.

If he asks your advice on a legal matter, or wants your advice about an investment, or a medical matter, give him all this advice you can.

Close the plant half a day for the funeral of your old employees. Go to the funeral yourself. You must be a sort of father to the workmen. Try to eliminate the soulless corporation feeling.

Lifting the Esprit de Corps

Always hire young men. Never lay men off for old age. Change them over to watchmen, gate watchmen, sweepers and roustabouts on light work, at a reduced pay. Use them for picking up odds and ends of material. They make ideal men for these positions and earn their wage. The trouble with most firms is they hire old men for these positions, instead of taking their own old men.

By getting rid of one or two men who are disturbing elements, the output of the whole shop can be increased. One or two men in a shop make a practice of telling the others that they wouldn't do this, and wouldn't do that—"don't be a horse," etc. These very men do not practice what they preach at all, but do good day's work. Their fellow workmen are blind to this hypocrisy.

Often foremen and workmen think they are turning out the maximum of work when they are not. Send the foremen to observe the work at other shops. Bring on machine demonstrators from the machine factories. They are sent free of expense, generally. Borrow a rapid workman from some other shop on a holiday. Let him put up a day's work. This will produce an enlightening effect.

*Copyright, 1912, by Stuart Dean. Eighth article on Shop and Foundry Management.

Buying Work from the Workman

The amount of work a man should do must be looked at in this light: The employer is buying work from the workman. Like other commodities, work worth a dollar should be obtained for every dollar spent. If the employer pays for 10 hours' work, he is entitled to the full 10 hours' work. This means the workman must start to work at whistle time—not begin to get ready to start then—and must not quit until the quitting whistle has blown.

The sole and only object of manufacturing is to make money. This should be kept continually in mind. A very large output per man is essential to success. Everything else is dwarfed in comparison to this. The so-called humane person may say that this is a hard way to look at the subject of employing our fellow men. A firm that looks at the subject differently fails. Failure generally brings misery to all concerned, including stockholders. Failure forces great hardship on the workmen for no fault of their own. Failure generally happens in hard times, when work cannot be easily found. Failure is bad for the old workmen. They may never be able to get good jobs again. They are changed from good, prosperous men, possibly with bank accounts, to men with all their life's savings gone. Prosperous firms are able to stand the strain of hard times, and their workmen share their prosperity.

Employer's Acts Having an Adverse Influence

Do not drive up to the plant in your $3000 automobile. The workmen will think it cost you $5000. They cannot help comparing the price of your automobile with the price of the home they have been trying to buy all their lives.

Do not put in window flower boxes and do not take employees to baseball games. In other words, do not do anything that looks as though you were throwing away your money. I never yet have seen a case where it did not bring out the remark from the employees: "Well, they must be making lots of money. They ought to put that into our pay envelope."

A Quarterly Method of Sorting Employees

Every quarter of a year get from each foreman a list of the men arranged according to their value or future value in a department. Tell the foreman that you want to know who, of all his men, he would hate the most to have quit. Then, who would be the next, etc., etc. Tell him not to place them in the list according to their wages, but according to their value. Ask him which men seem to be capable of rising more rapidly than the others. They are the ones that will be valuable to you in the long run. Those who cannot rise, replace with green men. This system will surround you with producing geniuses.

This once-a-quarter talk has a tendency to keep constantly before the foreman the fact that he has men of different calibers. It puts it clear in his mind so that he will get rid of his poor men and hang to his good men.

Training One's Own Skilled Help

Make your own mechanics. Weed out the poor ones. It is the only possible way to get the valuable men. You cannot hire them from other shops. The good workman rarely shifts from one shop to another, because his employer, appreciating him, will not let him go. The mechanics that you will teach will do the work your way. They will stay with you, as they are not sure they could hold jobs outside.

Hire bright laborers and teach them the trades. Take men, not boys, for the man who has had to struggle along at laborer's wages, supporting a family, will do the most good and be satisfied with his pay if you treat him fairly. The opportunities for laborers to become skilled mechanics are so few that your efforts will be appreciated. The laborer will be satisfied with a more moderate rate of wages than the shifting mechanic that you hire from the outside. At first your foremen will hate to be teachers, but soon they will get used to it and prefer it.

It is best to have a backbone of speedy, accurate, all-around, high-priced mechanics through your plant. This will be a skeleton framework around which the force is built.

If the system of breaking in green men, instead of hiring outside skilled mechanics, is followed, a plant will never be troubled about scarcity of labor even when other shops in the locality cannot get men. It requires time and patience, and a free hand at laying off the unsuitable ones. Only about one man in six will be found suitable to learn the trade, but the trouble of trying them pays many times over in a large output per man and a large output per dollar spent in pay-roll, and this is the real object of the game.

A contented family feeling springs up in a plant managed in this way, which is a fine thing. Labor troubles are eliminated. The paid agitator never poisons the minds of the men, because he is never hired under this system. The men appreciate what has been done for them and value their positions. The plant gets a good reputation among workmen and draws the best talent from the locality.

The Matter of Employing Boys

Use boys where it is practicable. The best 35-cent per hour man cannot compete with a good 14-cent boy on plain work. To come out even, the man would have to turn out two and a half times the boy's output. Here is an actual comparison from the cost cards of cost of work when done by boys and by men. The job was machining and drilling 100 cylinder heads by two men getting 21 and 24 cents per hour respectively and by two boys getting 7½ cents and 5 cents. It took the men 12 hr. to get out 100; cost $2.74. It took 16 hr. for the boys to get out 100; cost 97 cents. This card was made out a number of years ago. Both the men's wage rates and the boys' rates were a good deal lower than they are to-day, but the ratio will run about the same.

Only a small proportion of the boys will stay with a firm longer than 4 years. They feel that they must make a try in the world outside the shop where they learned their trade. I have found that the proportion of boys that can be taught trades runs much higher than the proportion of men that can be taught; that is, less weeding is necessary with boys than with men. The reason for this is that there has been very little picking over of the boys, so that there is a good chance of getting a boy who will represent the average of the whole boy kingdom. The men who are out of work are likely to be the poor leavings that no one could use, so the chance of getting a genius is not so good as with the boys.

Shop Thieving

Thieving is generally done by recently employed men. One gets acquainted with his old employees; they become part of the family. The transient is the one who steals. Bar off and lock up the department of the plant where valuable material is kept.

In order to stop thieving, the superintendent must be on such terms of familiarity with his men that they feel free to inform him of irregularities. This is his grapevine telegraph through which he gets his inside information. The manager or superintedent has but two eyes. As he walks through the plant, his field of vision, as already stated, is limited to an area of a few square feet. This area is on dress parade. The things that go on when he is away are what he should know about. The good men need no watching. They are by far the great majority, otherwise our social system would not hold together.

No system of checking or red tape will discover stealing. I remember a case in a factory in our town where stealing was going on. I happened to know, personally, a young man in this factory who told me the incident that led to discovering the stealing. One day the wife of one of the employees came into the office. It seems she had been having a row with her husband and he had left her. She said, "I don't think it is right the way my husband is stealing from you." This was the first they knew of any stealing. An examination of the barn disclosed an enormous mass of stolen material, small tools, etc., including a 3-hp. electric motor bought of outside parties to drive a small new lathe. This company had a wonderful system of checking, and yet the theft of the motor was not discovered by it.

I know a case where a man continually stole the sweeper's broom. The broom was marked with the firm's name, and a large cross was painted on the straw part. Only a very shortsighted man could suppose that the broom would not be missed immediately. This man stole four or five brooms before he was caught. I also heard of a man in

a big electric company just outside Pittsburgh that had a sack made in the lining of the back of his coat. He came in the morning a straight man, and went out round-shouldered, from a mass of sheet brass clippings under his coat. He tried to steal the intershop telephone. This is where his shortsightedness came in, and he was caught.

Courts give light sentences to thieves, on account of the sympathy of the public, and thieving is profitable though the thief may serve a prison sentence occasionally. Thieving is a serious loss to both employers and employees, and requires constant watching. Thieves are very lacking mentally, and are easily caught by being led into a trap. For example, a number of pieces of brass can be left around where the thief will notice them and will steal them. If this is repeated, with some one watching the pieces, he is easily caught. After making sure of the thief, dismiss him. The main point is to get the thief out of the plant. It is a duty to the honest workmen, as well as to the employer.

Increasing Wages as Time of Service Increases

Start the green men whom you expect to make into mechanics at the standard rate of laborer's wages paid in your locality. Make up a table of raises that will retain the men in your service. Give the men raises in accordance with their length of service. Give the increase by half cents. Don't wait until it is time to give a man one cent, or two and a half cent raise. The little constant sugaring of the pay envelope keeps them encouraged, and makes them realize that their work is appreciated.

It may seem an unjust system to give raises according to time of service, and not according to the relative value of men, but it is not. If you get rid of poor learners, you are sure of a force of men somewhat even in their mental capacity, and other things being equal, the longer a man stays with you, the more valuable he becomes.

Besides this, it is a very satisfactory system for the man. He comes into your employ, we will say, a young man, just married, with low expenses. He and his wife are boarding possibly with her parents. His expenses gradually increase. A baby comes into the family. His wages are going up to keep pace with his increase in expenses. He rents a house; more money is in the pay envelope. He has more children; again a raise. After he has been with you 6 or 8 years, the old folks come and live with him; more expense. By that time, he is making good pay. See what a satisfactory life he is leading. He will continue to get raises as long as he stays.

Now, instead of this, suppose you had jumped his wages to the full amount in three years' service. He would have jumped up his expenses. In other words, the fixed rate of raises fits the natural fixed rate of expenses incurred by a man as he goes through life. There is nothing an old employee hates so much as to see newcomers paid more money than he receives.

The Wages Increase System in Its Working

According to the above-mentioned table, a man's wages increase rapidly during his first year, less rapidly during his second year, and still less rapidly during the following years until he becomes an experienced workman, when his rate is fixed in comparison to his standing with the other men. Those who are not satisfied with the table rate of increase should be allowed to leave. The man who expects mechanic's full wages before he has learned the trade is not a desirable employee. A dissatisfied workman is unprofitable, and creates dissatisfaction among his fellow workmen.

On hiring the green man tell him just what his raises will be and when they will come. He will take more interest in the work knowing there is a great future for him.

When it comes to giving a man a raise let the foreman notify the man. When it comes to the refusal of a raise asked for, let the superintendent notify the man. This will keep a good feeling between the foreman and his men. I do not mean by good feeling the catering of a foreman to his men. A foreman of that sort should be gotten rid of immediately, as the men will run him to death, and you probably will wind up with a strike in his department.

Another good system of raising wages, which will apply to a small department—say the core room of a foundry—is to pay the best workman a rate higher than the standard for his trade. Pay the second best man the standard rate, the third man under the standard, the fourth still less than the third, etc. The newest learner will get a rate about 25 per cent. greater than laborer's wages.

The National Automobile Shows

The thirteenth national automobile show in New York will continue from January 11 to 25 in the New Grand Central Palace and Madison Square Garden simultaneously. The walls of the former will be redecorated for the occasion, a noted artist now supervising the painting of landscapes popular with motorists, while the latter building will also have an original scheme of decoration. During the second week, beginning January 20, which is devoted to commercial vehicles, it has been decided to hold a machine tool exhibit. After a conference with President Bullard of the National Machine Tool Builders' Association, and with the approval of the Executive Committee, the Show Committee of the Automobile Board of Trade reached this decision last week. It is considered an ideal time for machine tool builders to reach the men who are vitally interested in their product. Automobile factories throughout the country are continually increasing their machine tool equipment, and engineers and makers of cars will be only too glad to have an opportunity to see such an exhibit, affording comparisons and revealing all that is new in the line. It is planned to make the display of the machine tool industry an annual feature at these shows.

The annual national exhibition of commercial motor vehicles will be held in Chicago from February 10 to 15, occupying the second week of the thirteenth annual national automobile show in that city. The display will be larger and more diversified than ever, filling all of the floor space in the Coliseum Building, Coliseum Annex and First Regiment Armory. Sixty-five motor truck and delivery wagon companies have contracted for space, and there is a waiting list of belated applicants. Manufacturers have reserved larger spaces than last winter and will display more models. Most of them have extended their lines by adding new models of different load capacity, while some companies that heretofore have confined their attention exclusively to gasoline vehicles will exhibit new electric models, and others that have produced only electric vehicles will show them side by side with gasoline trucks that they have brought out. In all there will be on exhibition about 250 different models of motor vehicles suited to every kind of industrial, commercial and municipal purpose. There will also be displays of parts, equipment and supplies by nearly 200 accessory manufacturers.

Iron Blast Furnace Practice Aided by Copper Metallurgists

Bradley Stoughton, secretary of the iron and steel division of the American Institute of Mining Engineers, makes the following interesting statement in commenting on the recent Cleveland meeting held under the auspices of that division, in the November Bulletin of the Institute: "A significant fact has been brought out by R. H. Sweetser, of Columbus, Ohio, and that is that to blast-furnace managers the paper of greatest importance was not a paper on iron, but was that on copper slags by Prof. Charles H. Fulton, of the Case School of Applied Science, Cleveland ["The Constitution and Melting Points of a Series of Copper Slags"]. Mr. Sweetser holds that the facts brought out will lead to the most valuable series of investigations in the metallurgical side of blast-furnace practice attempted since the days of Lowthian Bell. The fact that copper metallurgists have advanced further than those engaged in the production of iron shows how much the co-operation of allied and associated branches is needed, through the intermediary of the general organization of the Institute."

The United States Geological Survey states that the production of gold in this country in 1911 was 190.7 net tons, valued at $114,981,080.

High Speed Radial Drilling Machine

Tool Combining the Features of the Sensitive and Radial Types

Providing a machine which is especially adapted to drilling and tapping small diameter holes at high speeds was the object sought by the American Tool Works Company, Cincinnati, Ohio, in the bringing out of its new high speed sensitive radial drilling machine. In designing the machine an effort was made to combine the high speed efficiency of the plain sensitive drilling machine with the productive capacity of the radial type so as to secure the drilling and tapping of holes up to an including ¾ in. in diameter with great economy. Convenience in operation, simple design and strong construction are the special features characterizing the machine. Fig. 1 is a view of the machine equipped with an elevating table while the arrangement of the motor drive is illustrated in Fig. 2.

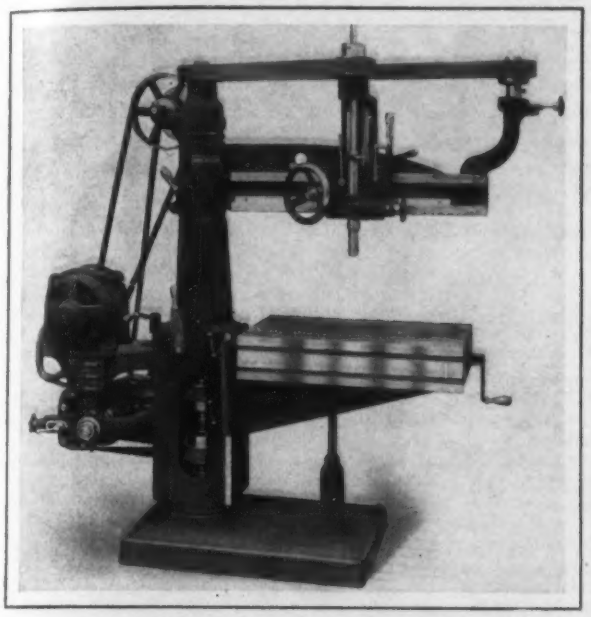


Fig. 1—The New Motor-Driven High Speed Sensitive Radial Drilling Machine with Elevating Table Built by the American Tool Works Company, Cincinnati, Ohio

As will be noticed from Fig. 1, the arm is of parabolic beam and tube section design and is very similar to that employed on the company's triple geared universal machine which was illustrated in *The Iron Age*, May 19, 1910. This arrangement, it is emphasized, affords great resistance to bending and torsional strains and provides a construction in which the lower line of the arm is parallel with the table, thus enabling the full capacity of the drill to be used at any point along the arm. The arm swings easily on the column and can be clamped securely in any position by a conveniently located binder lever. This is no vertical adjustment for the arm, provision for varying the hight of the work being made on the head.

The head is of a simple design, consisting of a main saddle which has a bearing on the arm and carries an auxiliary sliding head upon a vertical dovetail. The arrangement of the sliding head is such that it can be moved toward or away from the table to accommodate a wide range of work. A conveniently located lever on the front of the saddle serves to clamp the auxiliary head securely at any point along the dovetail. The head can be rapidly traversed along the arm by a rack and pinion operated by a handwheel which is located on the front of the head at the operator's left. This location enables the operator to swing the arm with his right hand and at the same time adjust the head along the arm with his left. A lever located on the back of the saddle, which is within easy reach of the operator from the front or working side of the drill, provides a means for clamping the head on the arm in any desired position.

The machine is ordinarily furnished with a full box type table which is strongly ribbed and is mounted on substantial legs. The top and front are fitted with T slots, planed from the solid, while the back is planed so that it can be used in squaring up work, etc. Although the hight of this table is such as to enable the average operator to stand up to his work conveniently, it is frequently necessary to drill larger castings on this machine than can be handled with a stationary table. For accommodating such work, the machine is furnished with an elevating table as shown in Fig. 1, which enables the distance between the spindle and the table to be increased greatly over that available with the standard type. This elevating table is of semi-box construction which gives a large working surface. The bearing of the table on the face of the column is very wide and the table has a gib adjustment and two binders for securely locking it in position. The vertical movement of the table is secured from the front of the machine by a crank which imparts motion to the elevating screw through a pair of miter gears located underneath the table. Where very large castings have to be drilled the maker is prepared to furnish the machine with a pedestal base, the table being entirely omitted.

As has been mentioned, convenience in operating the machine is one of its special features. All of the levers and operating members are placed in convenient locations for the operator and the feed lever which is probably used more than any other operating member of the machine, is placed on the head directly in front of the operator. This position on the right side makes it convenient to operate and it is emphasized also obviates any possible interference with the work set up on the table. Another advantage of the ratchet lever feed used on the machine is that when the lever is placed in its vertical position, it is automatically disengaged from the rack pinion shaft and the spindle can then be adjusted in either direction quickly by a small star knob on the end of this shaft. This is a feature which it is pointed out is quick and handy for bringing the drill toward and away from the work. The spindle is of high carbon crucible steel and has a dustproof self-lubricating ball thrust bearing. There are six changes of speed ranging from 300 to 900 r.p.m. in approximate geometrical progression, and there is an adjustable stop collar which may be used as a depth gauge at the top of the spindle.

As illustrated in Fig. 2 the machine is driven by an electric motor. There are no gears in the driving mechanism of the machine from the countershaft to the main spindle, the drive being accomplished by a 2-in. double belt running at a high rate of speed. The tension of the spindle belt is regulated by turning a star knob located on the arm bracket. The countershaft which provides two speeds is of a special design for high speed work. The bearings in the hangers are of the builder's new improved gravity and wick oiling type which receive their supply of lubricant from large oil reservoirs that require attention only at long intervals. The countershaft has a three-step cone pulley and is equipped with a pair of friction pulleys 10 in. in diameter with a 3-in. face, which should run at 310 and 387 r.p.m. respectively. All the driving and idler pulleys have a special type of ball bearing consisting of a double set of hardened and ground ball races and cones, one set being located at each end of the pulley journals. These are so constructed as to be dustproof and form a retainer for the lubricant. When the machine is belt driven a single-speed countershaft is furnished, the spindle speeds being obtained through the three-step cone pulley and a pair of friction pulleys of different diameters located on the rear of the machine.

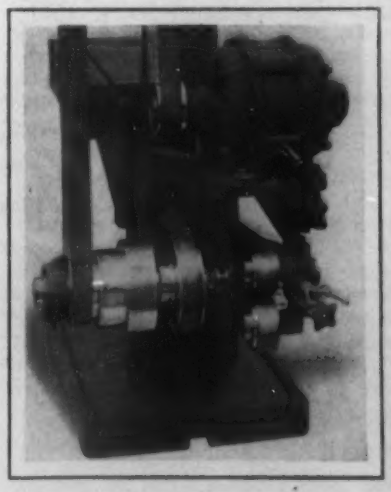


Fig. 2—Side View of a Portion of the 3-Ft. Machine Showing Arrangement of of Motor Drive

The National Founders' Association Meeting

Pro-Labor Legislation, Past, Present and Impending; Provision for Workmen's Compensation; Efficiency in Management, and Fire Prevention Considered

The meeting last week in New York City of the National Founders' Association disclosed an atmosphere, at least so far as employers of molders are concerned, surcharged with forebodings of the outcome of recent and expected legislation generally regarded as specially favorable to labor. Not a few, indeed, while acknowledging the general prosperity which has visited the country, expressed doubts in respect to the permanence of the condition; and on all sides there were more confessions than usual of the negligence of the employer to fulfil the duties of citizenship, more convincing personal resolutions to act immediately and constantly to direct legislation along reasonable channels and wide acknowledgment of the need to use available statistics to show that the people in this country are far from being as badly off as claimed by the advocates of the undesired legislation.

The sixteenth annual convention of the National Founders' Association, held in the Hotel Astor, New York City, November 20 and 21, was one of unusual inspiration. The formal contributions to the meeting—the reports of the officers and the papers and speeches—were on a high plane and possibly with one or two exceptions altogether free from exhibitions of selfish interest. The fact is all the more noteworthy in view of the voluminous and admittedly ominous National legislation, which naturally was of absorbing prominence and vitally interesting as threatening to injure the resources of both employer and employee. Two of the lessons to which the members seemed to be especially receptive were that the individual citizen may really exercise considerable influence by means of the individual letter or telegram with his government representative and that statistics are easily available to controvert the charges commonly made that some classes of workers of the country and some industries are suffering under present conditions and to prove the strong position and rapid strides taken by this country.

The association held a two-day meeting, with two sessions on each day and a banquet on Wednesday evening. As formerly the "Alumni" of the association, comprising past and present members of the Council, met for dinner on Tuesday evening, or just before the convention itself, and as stated last week the speeches had to do, as is usually the case, with the problems of the industry. The convention gave most consideration to the national legislative program, but it had time to consider provisions for workmen's compensation—a feature of industrial operation not merely agreed to but favored—and also some practical considerations in efficiency management and the great need for more attention to fire preventive measures. The two banquet speeches were remarkable, as a subjoined brief notice will indicate.

The report of the first session, that of Wednesday morning, November 20, is largely the reports of the officers, including that of the legislative representative of the association at Washington, but the meeting found time to listen to a fetching speech by M. W. Alexander, of the General Electric Company, Lynn, Mass., on safety and sanitation. Generous extracts of the reports of President O. P. Briggs, Secretary J. M. Taylor and Commissioner A. E. McClintock are here given.

President Briggs's Address

In all probability the foundry business for the past six months has been nearly up to its normal stage. Some believe it is but temporary, being brought about by the heavy purchases of equipment by the railroads to move the abundant crops, and they hold that as soon as these temporary demands are filled the same prosperous condition will not long prevail. Time alone will determine this.

Our hope is that the experiences of the year just closed will establish a new precedent for the future, that the idea which has prevailed for so many years that a presidential election presages business depression will be dispelled, and that during this period, as well as at other times, the demands of the country will be cared for and its business move on uninterrupted.

VIOLENCE IN BEHALF OF LABOR

One year ago the eyes of the country were centered upon the McNamara cases at Los Angeles. Much speculation prevailed as to the guilt or innocence of the parties, and as to whether the result of the trial would be an acquittal or a conviction. We all breathed more freely when the McNamara's confessed, and I believe a large percentage of our people directly affected by unionism entertained the hope that with so complete a confession as was made in this wholesale dynamiting outrage those union leaders who had so vociferously championed the cause of these culprits would lose their prestige and their hold upon public opinion. That this hope was in vain is best illustrated by the fact that the very same labor leaders who shouted from the housetops the innocence of the McNamaras and their followers were the men who secured at the hands of Congress the pernicious labor legislation it inaugurated last season.

At the present time we are all watching with intense interest the trial in the Federal Courts of 49 as accomplices of the McNamaras. From the evidence already reported it would seem as if the case is as complete and convincing against these 49 as it was against the McNamaras. Again we raise the question: Suppose they are convicted, will this further exposure of wholesale dynamiting by one of the principal American Federation of Labor unions be sufficient to change public opinion?

THE 8-HR. LAW FOR GOVERNMENT WORK

The 8-hr. law heretofore applied to government work is now extended to all contractors and sub-contractors, and sub-contractors of sub-contractors, way down the line to the last man who furnishes anything by virtue of the original contract.

The unions have been boasting ever since this law was enacted that it is only a question of a short time when the same schedule of hours will be extended to all private contracts, the United States government having taken the initiative. As they present the case to their listeners, the United States government having been forced by them to adopt 8 hr., the next step to private contracts is easy. It is surprising to note the extent to which they carry this argument in their union debates, and the readiness with which a very large number of our working people believe their statements are correct.

Again, I refer particularly to the penalty imposed upon any proprietor who permits an employee to work more than 8 hr. Here the government says that any employer on government work who *permits* a man to work more than 8 hr. shall be fined $5 per man for every day the rule is violated. This certainly is carrying the enforcing power to the greatest possible extreme. As for myself, I fail to understand how this particular feature of the law can be constitutional.

THE CONSTITUTIONALITY OF THE LAW QUESTIONED

A vast majority of employees are always anxious to improve every opportunity to earn and lay up more money for the rainy day. In good times the employees and the employers agree that it requires longer hours—the employers want the work done and the employees want to do it. Then the government steps in and says that it cannot be done. I know of no greater injury that can befall a workingman than that which deprives him of his right and opportunity to convert his labor, and as much of it as he wishes, into the necessities of life. His labor is the only asset he possesses, the only resource from which he can earn money to support and bring up his family.

And when you consider the hardships imposed on the employer when he invests large sums of money for expensive machinery and is compelled to allow it to remain idle a good portion of the time the injustice multiplies.

Nor is a consideration of this subject complete without analyzing the position of the consuming public. To whatever degree the hours are reduced the cost increases. Even if the hours were not already set at as low a point as is

consistent, it would certainly seem that this is not an opportune time to increase the price of commodities in the face of such opposition as we already have to the present cost of living.

MACHINERY HAS REDUCED NUMBER OF HOURS

Closely related to the question of hours comes the improved methods of manufacture brought about by the introduction of labor-saving machinery and devices. I have often said to you that there was a time when the working hours were too long, and with the greatest of pride have I referred, and now refer again, to the fact that members of the Founders' Association were among the first to reduce the number of working hours to the present schedule, which I believe to be a just one.

Improved machinery has played an important part in making this reduction of hours a possibility. Compare conditions prevailing in our foundries 25 years ago with those current today, with a multitude of mechanical devices that conserve human energy. Twenty-five years ago even an old-fashioned jib crane, the operation of which requires the muscle and strength of a large number of men, was considered a great improvement in the foundry. A tremendous amount of labor was exercised in preparing the iron and charging the cupola; in the ramming; the lifting, the closing of flasks; in the shaking out and removing of the castings; in the cleaning; and in their delivery to the machine shop. Compared with the present, we have nearly this entire amount of human energy conserved by the use of an incalculable variety and number of pneumatic, electric, magnetic and hydraulic cranes, runways, tramways, air-hoists, pneumatic rammers, jolting machines, sand blasts, etc., etc. Perhaps as striking an evidence of this elimination of muscular work as one notices is found in the jolting machine, which, when applied to large castings, will ram in 3 to 5 min. a casting which before required the exercise of severe muscular labor of a half dozen molders for a week.

Enter the machine shop and you will find the same elimination of physical energy. To illustrate, the machinist who formerly was compelled to exercise an enormous amount of muscular effort in placing heavy castings in position to be machined, today has them placed by the power-driven crane. Scan your plants as thoroughly as you will and you find an exceedingly small percentage of the men employed who are actually working. They are watching the machinery work.

LESS NEED FOR PHYSICAL EXERTION

Consult the workingmen themselves upon this point, as to whether or not they prefer to work 10 hr. under modern methods and receive proportionate pay, or be reduced to 8 hr., and they will say by a vote of at least 80 per cent., "Give us 10 hr. work and 10 hr. pay."

Now consider the inconsistency of the position taken by union leaders. One of their strongest stock-in-trade arguments for shorter hours for the last 50 years has been the enormous amount of physical energy put forth by the working people, and their claim has been that the people in the foundry industry in particular are compelled to exercise themselves almost to the point of sheer exhaustion every day in the week and every week in the year—a most brutal condition. Today they present the same arguments. They will not recognize the benefits derived from the introduction of labor-eliminating machinery. They have fought from the time of the organization of their unions to the present the introduction of any of this machinery which relieves the laborer of those hardships. It is true they do not oppose the introduction of this machinery as much as they formerly did in many localities, owing to the fact that they have been overpowered in their opposition, but wherever they find a proprietor who is weak, whom they feel they can handle, they will force on him the question of improved machinery just as promptly as in years gone by. If those union leaders really and truly believe that shorter hours are required by the working people and that the present cost of living is excessive, they most assuredly should improve every opportunity to reduce the cost by accepting every mechanical or other improvement.

INDUSTRIAL INVESTIGATION COMMISSION

The law creating an industrial commission was enacted at the last session of Congress. It contemplates a thorough investigation of industrial conditions throughout the United States. It provides for a committee of nine, three from organized labor, three from the employers and three disinterested parties, to be appointed by the President, with the consent of the Senate, at an early date. The appropriation for the first year for this commission is $100,000. They are empowered to subpoena anyone, investigate wherever they please to such an extent as they see fit and are directed to make their report within three years. This investigation had its inception in the minds of the union. It is now a law, and will be put into effect promptly. It behooves every employer in this country to take an active interest in getting before this commission actual prevailing conditions.

The union will endeavor to get before the commission the very worst conditions they can cite, and having once secured such a report will attempt to characterize the entire industries of the country by these few undesirable localities. Perfection was never attained in this world in any line, and because a few people are unfair to the employees and a few localities are not what they should be for the best interests of the working people, it certainly would be the greatest disgrace that could befall us to have the entire community so stigmatized. You cannot console yourselves with the thought that probably the report, voluminous as it will be, will eventually find a perpetual lodging place in the archives of the government, where such an enormous quantity of this sort of government literature is continually lodged. Such will not be the case, for the labor leaders of this country will use these reports in every locality in this broad land if they succeed in dominating them.

EMPLOYERS' LIABILITY AND WORKINGMEN'S COMPENSATION

This association enjoys the distinction of being one of the first to investigate this question. It is true, as an association, it has never committed itself to any specific measure. There have been times when in the minds of a great many we were thought remiss in our duties in remaining silent. Subsequent events have proved, however, the wisdom of this silence. Up to date there has been no legislation introduced in this country which seems entirely satisfactory, but with the experience of the several states that are now operating with such laws available, I believe the association will very shortly be in a position to indorse and recommend the proper kind of legislation.

BUSINESS MEN IN OFFICE

And now we come to the question of the representatives of all of us who are sent to our congressional and legislative assemblies to enact laws. Right here you find the difficulty. It has been estimated by people whose judgment ought to be good that out of the 531 representatives and senators at Washington we have not to exceed 50 who can be considered business men. With all due respect to the entire number, how can this body be competent to pass upon such questions with so small a number of experienced men among them?

THE REVIEW

A brief history of the magazine of the National Founders' Association, The Review, may interest those of you who have recently become members. In the early experiences of this association one of its distinguished presidents urged as a feature of its future work an attempt to reach the working people of the country, and particularly the molders, through literature that would tend to counteract the influence of the socialistic and radical unionism of the time, as presented to them continually. Soon after the retirement of this gentleman from the presidency the council undertook the task. The time came when it became apparent that the molders themselves were hungry for that sort of food which would enable them, by having both sides of the case, to form their own conclusions as to conditions prevailing in this country and as to their own welfare.

MEMBERSHIP AND FINANCES

The secretary's report records a handsome increase in membership during the season. Not only is it a good showing in numbers, but the character of the shops admitted is splendid. We find some proprietors running union shops who are able to introduce molding machines and improved appliances, operating them with but little or no opposition from the union, as compared with conditions prior to 1906 and 1907. Many a union shop is producing a satisfactory output on molding machines operated by handymen. When we analyze the situation and attempt to ascertain the reason for this tremendous change, it is invariably found in the success of the collective effort of you gentlemen who have formed this association and stood by it for so many years. Modern methods of producing castings could never have been accomplished single-handed.

The treasurer's report indicates a very healthy condition of our finances. During the year it has been thought wise by the administrative council to levy special assessments to meet the extra expenses occasioned by an increase in strikes.

CO-OPERATION WITH OTHER ASSOCIATIONS

During the year it has been the aim of your officers to continue to co-operate with other associations, both national and local. The co-operation between the National Metal Trades' Association and our association has been a little closer than with any other association, owing to the similarity of our work. Some years ago, by way of committees, we agreed to co-operate and unite in the defraying of expenses upon two specific subjects, namely, The Re-

view and legislation. Subsequently, the Metal Trades' Association withdrew its contribution to the legislative expense, and a little later withdrew from contributing to The Review. Recently, however, the agreement in regard to The Review was renewed.

CHAMBER OF COMMERCE OF THE UNITED STATES

During the year the Chamber of Commerce of the United States of America has been organized at the recommendation of President Taft and Secretary Nagel, who called a meeting of the organizations of the country to consider the subject. The purpose of this new organization is to provide a lawfully constituted means of communication between the government and the business interests of the country. The government has gone so far as to propose providing a way for the incorporation of this association by special laws enacted for the purpose.

Our association was represented at the preliminary meeting; subsequently the council voted to join, the expenditure being $250 per annum. There is a question in the minds of some as to just how far this new organization can be of help to our association. Most people recognize the advisability of the government and the business world coming more closely in contact. It remains to be seen whether the new organization will take up matters pertaining to the work of this organization or not.

PERSONNEL OF THE WORKING FORCE

Soon after the 1911 convention we lost one of our most efficient officers, F. W. Hutchings, our secretary. While we regretted exceedingly losing his services, it was very pleasing to know and understand that he left us not because of any dissatisfaction whatever, but in order to secure a more lucrative position, the new position which he accepted commanding a salary considerably in excess of what this association should pay for the services of a man in that capacity.

The association was extremely fortunate in having at its command and in its employ a man who was eminently fitted to succeed Mr. Hutchings. J. M. Taylor, the present secretary, has been in our employ almost from the organization of the association. He has filled several important positions. He was in charge of the New York office for several years, where his work was very efficient, and where he created an extremely favorable impression among our Eastern members. He was well prepared to undertake the work of the secretaryship, and it pleases me much to report that his efforts have been more than satisfactory.

By reason of this change the question of centralizing our forces at the Chicago office was considered by the council, and after a careful analysis of the problem it was unanimously agreed that the work could be very materially expedited by having the commissioner and secretary at the same office.

As the working force of the association is now constituted, Mr. McClintock, commissioner, and Mr. Taylor, secretary, are located at Chicago, which is the main office of the association. On the promotion of Mr. Taylor, D. B. Hinckley was placed in charge of the New York office. Mr. Cushing has continued in the capacity of our representative in Washington, and Mr. Wright is foundry expert. This corps of men, in my judgment, forms an administrative force rarely equaled and never excelled.

I again take this opportunity to thank the members of the council for their most loyal and efficient support. And especially do I refer to your vice-president, Justus H. Schwacke, who is always ready to serve the association, contributing his time and energy in a most unselfish and generous manner; without such support no executive officer of the association could successfully administer its affairs.

Report of the Commissioner

The foundry industry has experienced a greater degree of labor troubles during the past year than at any time since the memorable conflict of 1906-7. The causes of the strikes were: Refusal to recognize union in 15 shops; refusal to permit union to control molding machines in 3 shops; refusal to abolish piece work in 1 shop; refusal to recognize union apprentice ratio in 1 shop; sympathetic strike with laborers in 1 shop. A total of 21 firms was involved and 841 men. In the same period the molders' union has prosecuted strikes against a total of 68 shops, not members of the association, from which approximately 2729 molders and coremakers went on strike. In all the cases where our members have been involved, the strikes have been or are now being combatted to a successful conclusion with the complete defeat of the union.

In connection with these strikes, it is of interest to note that a large number of molders and molding machine operators were taken into the union by the promise of immediate strike benefits, the initiation fee being deducted in weekly payments from the strike benefits. In other words, the non-union workmen were given practically the same support as the older union members. Due to betterment in trade conditions generally and the constant efforts of the paid agitators, there has been an unusual degree of unrest in labor circles this season. The conditions have brought requests from a very large part of the membership for consultation with the association's representatives, keeping them extremely busy, and individual members have thus had placed at their command accurate and reliable information as to wages, hours and conditions in other districts.

LABOR SUPPLY.

An adequate supply of labor is always of vital importance in good times. Especially is this true in the case of the foundry. Until a greater and more widespread attention is given the subject of educating men and boys in the molding trade, we are bound to have a shortage. The scarcity of molders has been particularly marked in the past four months. The foundry capacity of the country is being largely and constantly increased. This is particularly true with shops devoted to agricultural, malleable and steel castings. In each of these cases, the tendency, almost without exception, is to draw molders from neighboring shops or nearby districts. The representatives of the association have urged the introduction of molding machines, and the employment of handymen with all the persuasive force they possess, but there is still much room for improvement.

While in previous reports I have had much to say on the use of molding machines and the economies effected thereby in not only the foundry, but the machine shop, I again urge the members of this association to keep this subject constantly before the minds of their foundry superintendents and foremen. Let there be constant effort toward the elimination of skill on the greatest part of your output, and where skilled men are required, endeavor to use such skill to the best advantage. Quite often a little investigation will disclose that a shop which is eagerly seeking molders could themselves take care of their requirements by a better handling of the men already in their employ, and such additions as are necessary taken from the ranks of laborers.

Now that the demand for workmen in out-of-door employment is lessening, the present winter months are opportune for action along the line referred to in the foregoing. Of one thing we are all certain—the available supply of molders will never be sufficiently increased until the foundrymen educate them, and the longer a proprietor depends upon the other fellow to do the educating, the worse this condition will become. While on this subject, I wish to add that shops which feel their responsibility to the trade are doing magnificent work in this respect.

CONTRACT MOLDERS

The system inaugurated in 1904 of keeping in the employ and constantly under the direction of the association a limited number of high-grade molders has been continued. It has proved a most effective method of assisting members in combatting strikes. As an outgrowth of their engagement with the association, many of these former contract molders now hold positions as foundry superintendents and foremen. I can recall quite a list of former contract molders who now hold such positions. While we have been sorry to lose them, yet we are glad to see them advance to positions which enable them to be of still greater service in maintaining the open shop, as well as enabling them to obtain a greater monetary reward for their services. Although a molder may be under contract with the association at a guaranteed salary, it has always been our policy never to stand in his way when he had an opportunity to advance to a foremanship.

FEMALE COREMAKERS

The employment of women in the making of small cores is increasing in importance—likewise the opposition of the molders' union is becoming more pronounced. In the production of small cores, where large quanities are used, there is a legitimate field for women, provided proper accommodations are furnished. While in this country the practice of employing female coremakers dates back 40 years, yet it is only in recent years that the total number has become an important factor.

I have visited many shops where women are employed for this work, and have found the workrooms separated from the other departments and having a private entrance. Separate toilet rooms are provided, and extra precautions taken to see that the heating, lighting and ventilating facilities are adequate. A forewoman is in charge, and stools are provided so that the woman can sit at work if they desire. The work is much more agreeable than employment in canning establishments, bottling works, laundries, etc., and the pay much better.

Officers of the molders' union have endeavored to raise a great hue and cry about women working in foundries under "atrocious conditions." In Massachusetts last spring a campaign of agitation was started. A bill was introduced in the legislature to prevent the employment

of women in corerooms, and the Governor appointed a commission to investigate. Every foundry in that state employing female coremakers was visited, but the conditions complained of were not found, and the commission so reported. However, to prevent abuses creeping in in the future, a bill providing proper and special sanitary conditions was proposed and passed with the hearty approval and support of the foundry proprietors. We are informed the molders' union did its utmost to block this legislation, and fought for their original bill to bar women from corerooms. As one of the officers of that union is reported to have remarked, "we are not interested in the humanitarian phase of the question, or in better sanitary conditions; it's the trade union stricture, the women are taking men's jobs and their employment prevents us from getting the men into the union."

At the National Convention of the Molders' Union held in Milwaukee in October last, the subject was referred to a committee and the following resolution passed as the committee's report:

> WHEREAS, Some foundry proprietors are substituting women and girls for men and boys in the production of cores, and
>
> WHEREAS, We believe that the foundry is no place for females, because of the brutal character of the work, and the unhealthful and unhygienic conditions surrounding such employment, and
>
> WHEREAS, We believe that the trade union movement of North America can do much to assist in bringing about a public state of mind that will cause the foundrymen to realize that the 20th Century civilization is not in favor of dragging down American womanhood, so that the foundrymen can increase their profits; be it
>
> RESOLVED, that we, the delegates of the I. M. U. of N. A. in convention assembled in Milwaukee, on this day of October 7, 1912, do hereby condemn the employment of females in foundries, and that we pledge ourselves to use every effort to bring about the elimination of same from the foundries of North America, and that the incoming officers be instructed to give such moral and financial support as will aid in bringing about such results whenever such assistance is sought in any movement having for its purpose the correction of such evil.

While possibly those members operating shops producing heavy castings may feel this subject bears but slight relation to their business and therefore is of small interest, I would call your attention to the fact that to the manufacturer of light gray iron castings or small malleable castings, it is of very great importance and is naturally bound to have our attention. I believe I voice the sentiment of the membership of this Association when I say that we are not in sympathy with any attempt to place women in positions requiring heavy lifting or hard muscular labor and heartily favor regualtion having to do with proper sanitary conditions, but we do oppose the attempt of the molders' union to drive out women coremakers from profitable and agreeable work, solely to put in men whom they hope to make contributors to the union's exchequer.

SANITARY CONDITIONS

The providing of better factory conditions is something which is taking a firm hold of the employers of this country in every line of manufacture. Foundry proprietors are spending much thought and money in an earnest effort to improve their shops. As an outgrowth of employers' liability laws, some of our members are requiring applicants for employment to pass a physical examination. Having engaged a workman in good physical condition, they are making every effort to prevent accidents, and by proper heat, light, ventilation and wash room facilities, at least do their part in keeping him well and strong.

There is also this thought which I find stands out prominently. The employer, having taken a firm stand for the open shop and having denounced as unjust and un-American the proposition that a workman's ability to obtain employment should be contingent on his having a union card and paying tribute to a union, he feels the responsibility of making his open shop a better place in which to work than the union shop. The old familiar cry of the union that only the union shops have proper working and sanitary conditions holds good no longer—if it ever did. The great majority of the more modern and better equipped foundries of the country are now either strictly non-union or open shops.

The Secretary's Report

At the last convention a resolution was adopted authorizing the circulation of The Review to be increased. Therefore, this year we have issued an average of 7000 copies per month. In addition, the National Metal Trades Association has co-operated as before and a certain number of copies has gone out each month to machinists.

It must be borne in mind that while we, of course, try to make the magazine interesting to the employer, its primary object is to interest the workman. All the articles are selected with the object in view of reaching the honest thinking mechanic, educating him to see the evils of present day radical closed-shop unionism and to learn that his prosperity is in direct proportion to the prosperity of his employer. There is no longer any reason to argue that education is the only solution of this labor problem; we believe that is conceded by most people. And yet, thousands of socialistic and unionistic publications are finding their way into the homes of workmen, with practically no effort being made to counteract their teachings. There is a difference of opinion, of course, in regard to the best means of conducting this educational campaign; our own is that it must be along sane, conservative, argumentative lines. The workman must be led up to the truth without antagonism and the statements made should be capable of verification.

BUYING POWER OF THE DOLLAR

There is no question that the American workman today is the most prosperous of any country. There is much talk of the high cost of living, and that the buying power of the dollar being so small, American wages should be many times that of foreign countries; the inference being that the dollar earned by the American is worth less than half or a third of the dollar earned by his European brethren. To disprove this fallacy, we can do no better than to quote from the writings of the man who has done at least as much as anybody in this country to stir up class hatred and instill in the minds of the workingman discontent with his conditions. In his book entitled "Labor in Europe and America," Samuel Gompers states on page 95:

> There's the matter of rent, usually rated by economists as much higher in America than in Europe. For hours yesterday and day before I was conducted through several working class quarters of the city. Such squalor, such composites of all things to be classed as dirt, such indiscriminate heaping together of human beings, I have never seen elsewhere. And their dens and holes of dwelling places cost the miserably poor occupants more per square foot of space than is paid by the prosperous artisan in any American city for his home with all its civilized accommodations.

And again on page 97:

> As to the cost of clothing, we had with us a highly intelligent young man, a Hungarian labor leader, who having spent a year and a half in America, was well qualified to make comparisons. He now buys American shoes regularly because of their comparative cheapness, their comfortable fit and their neat appearance, though he is obliged to pay more than New York prices. Suits of clothes and hats, he said, were of better make, and quality considered, just as cheap in America as in Hungary. Our inquiries did not end with him, but from all sources obtainable we obtained the same testimony.

And again on page 229:

> My facts indicate that money wages in America in many trades are at least double those paid abroad.

On page 234:

> For example, Bremen is the only considerable city in Germany which has small single-family houses adapted to the needs of working people. Only the big tenement-house, except in rare cases, is to be found in other cities. The wage earner in them is regarded as permanently a rent-payer, an animal in a stall in a five, six, or seven story stable. No, not one animal in one stall—not so good as that; whole families or a herd of lodgers live in one of the stalls.

And the last paragraph of his book:

> The Old World is not our world. Its social problems, its economic philosophies, its current political questions are not linked up with America. All the people of the globe may be on the broad highway to social justice, peace among men of all tongues, and universal brotherhood, but all the nations and governments have not reached the same points on the road. In the procession, America is first.

We have had a section on accident prevention each month in The Review. The last few months these have pertained mostly to the machine shop, and the main article has been furnished by Mr. Doolittle, safety inspector of the National Metal Trades Association, and at this point we wish to acknowledge the assistance of Mr. Wuest, commissioner of that association, who has cooperated in this undertaking with us to the greatest extent. In the machine shop, of course, a guard can be made for a machine, which a man can be compelled to use, and more definite instructions can be issued than in the foundry, where the means of prevention is more personal. We have, however, tried to show the right and wrong kind of clothing, the proper way to carry a ladle; the common molding machine accidents and their prevention; the necessity of proper light, clean gangways, etc., and we are planning to continue these articles right along in the future.

A New Form of Foundry Flask

Mr. McClintock supplemented his report by exhibiting a large number of lantern photographs. Among these were shown a form of flask which the Hardie-Tynes Mfg. Company, Birmingham, Ala., builder of Corliss and slide-valve engines, air compressors, hoisting engines and the like, has developed and was willing that others take

advantage of. The flask is intended for large patterns with dry sand on the jolting machine. Instead of the heavy braces forming usually a part of both the cope and drag of large flasks for large molding work, a grid-iron is bolted or otherwise made a part of both parts of the flask and the cope at the parting face has a plate affixed to it, with an opening large enough to accommodate the pattern at the parting surface. This plate forms what may be called a shoulder or a ledge to assist in carrying the sand when the cope is lifted and it provides a means for carrying bars or other methods of support to assist in holding up the sand especially when a pattern of smaller size than the flask can take is used. The grid-iron plates make it unnecessary to use bottom or other boards and they provide means for fastening rods or other supports to assist in holding the sand together as may be needed. The important feature of the flask is that it may be made to accommodate a large range in size as well as shape of pattern. The absence of the heavy cross braces means that there is no necessity for casting braces with the proper contour to admit the pattern, and the use of the grid-iron means also that it is not necessary to go into the pattern storage yard at any time a new pattern is taken up in order to get a plate of the proper size to fit the proper size flask. It is somewhat difficult to describe the flask clearly in a few words and it is hoped shortly to be able to present some photographs which will assist in this direction.

Safety and Sanitation in the Foundry

Mr. McClintock through his lantern photographs also dwelt on the provisions for safety and sanitation now to be found in a large number of foundries. He showed wash room and lockers and arrangements for supplying cool drinking water through drinking fountains in the plant of the Taylor & Boggis Foundry Company, Cleveland, Ohio, the plant of which was recently described at length in these columns; the hospital, drinking fountains and general lighting and window ventilation in the plant of the Nelson Valve Company, Philadelphia; the model kitchen and dining rooms in the plant of the Phillips & Buttorff Mfg. Company, Nashville, Tenn.; the shower baths and emergency hospital at the plant of the American Cast Iron Pipe & Foundry Company, Birmingham, where marble benches are in use for wash basins for the workmen, who furnish their own towels; core rooms for female workers in the plant of the General Electric Company, at West Lynn, Mass.; the illumination by flaming arc lamps of the General Electric Company's plant at Pittsfield, Mass., and the remarkable new foundry of the General Electric Company at Erie, Pa. In the latter case, the hight of the interior and the construction of the roofs and the large amount of window lighting are conspicuous, and one of the interesting arrangements is the delivery to the core room of core sand in three spouts, one for each kind of sand used.

Standardizing Safety Appliances

On the standardization of safety appliances, Mr. Alexander contributed vigorous argument to the effect that a movement should be put on foot to bring about standards in safety appliances, and the result of his plea was the appointment of such a committee. Mr. Alexander felt that it was a hopeful sign that employers are taking so much interest in accident prevention. He suggested that some radical legislation might have been prevented, however, if voluntary measures of prevention had emanated from manufacturers to a greater extent than had been the case. To prove his case that there was need of a general agreement to avoid duplication of effort, he mentioned that as a representative of the committee of safety and sanitation for the plants of the General Electric Company, he had tried to get assistance and received about as many types of advice, in respect to goggles, for example, as there were types of protective spectacles. So far he has had to make his investigation independently.

The services of an expert foundryman were desirable, who could collect information and make recommendation. He suggested also that there should be a co-operative effort with other associations. While he admitted that the best accident prevention device is proper care on the part of the employees, the movement should go hand in hand with educative efforts and in addition the committee ought to work to help by arranging for talks before workmen. It was on motion of W. H. Barr, Lumen Bearing Company, Buffalo, N. Y., that a committee was appointed to consider the subjects in its various ramifications, and this committee, as appointed later by the president, is as follows: Mr. Alexander, G. W. Mixter, vice-president Deere & Co., Moline, Ill.; Dr. E. A. Rumely, La Porte, Ind.; Mr. Barr and H. P. Macdonald, Snead & Company Iron Works, Jersey City, N. J.

Committee Appointments

The following convention committees were appointed in the morning session:

Resolutions: F. B. Farnsworth, McLagon Foundry Company, New Haven, Conn.; Theodore O. Vilter, Vilter Mfg. Company, Milwaukee, Wis.; Lyman P. Hubbell, Fillmore Avenue Foundry & Iron Works, Buffalo, N. Y.

Press: Marshall Cushing.

Introduction: S. L. Moore, Moore Brothers Company, Elizabeth, N. J.; H. N. Covell, Lidgerwood Mfg. Company, Brooklyn, N. Y.; Thomas M. Eynon, Eynon-Evans Mfg. Company, Philadelphia; William H. Barr, Lumen Bearing Company, Buffalo, N. Y.; F. B. Farnsworth, New Haven; J. W. Gardner, Gardner Governor Company, Quincy, Ill.

Finance: Henry A. Carpenter, General Fire Extinguisher Company, Providence; R. I.; William S. Hallowell, Harrison Safety Boiler Works, Philadelphia; C. M. Power, St. Paul Foundry Company, St. Paul, Minn.

Influence of Organized Labor on Legislation

Marshall Cushing on Wednesday afternoon presented a long report on recent and pending legislation at Washington. "It would be folly to deny," he said, "that the friends of the open shop in industry and the opponents of radical class labor legislation steadily got the worst of it in the last session of Congress." Twenty so-called labor measures passed the House at the last session, among which he mentioned the following: the eight-hour bill, the children's bureau bill, the anti-injunction bill, the contempt bill, the department of labor bill, the industrial commission bill, the resolution to investigate the Taylor system; the seamen's bill "to give freedom to the seamen;" the convict labor bill, the right of postal employees to organize and the provision in the post office appropriation bill admitting the organs of trades unions to the second-class mail privilege. Under the new conditions evidently settling down on the next Congress, if not under present conditions, the Senate, he felt, cannot be depended upon even to discuss fearlessly and thoroughly the other so-called labor measures when they reach the upper branch.

How to Stop the Carnival of Class Legislation

Since majorities rule in states and districts, and in legislative bodies generally, there is but one way out, Mr. Cushing agreed, and this is to induce the majorities, whether in the Senate or the House or in other legislative bodies, to prefer measures intended for the good of all, not for the good of a class, and to be well enough organized and interested enough to bring about, not once, but continuously, the election of men who will at last realize that it is expedient, as well as right, for them to support measures for the good of all and not for the good merely of a few.

This can come about only by a process of education. There are various ways to go at it. They are comprised in the single and simple program of permitting no falsehood, no false economics, no false philosophy or sociology, to be propagated anywhere without combating it to a standstill; and then, after that is done, or as it is being done, must be an equally widespread and continuous propagation of the truth constructively. To do the industrial defense work now, he added, and the work of preventing, if possible, the enactment of class legislation is futile; for those public men who would stop this "carnival of class legislation" would only be destroyed for it, and those who would begin now and go into public life with a view of acting from conviction in the present lack of education on the subject, would only face disappointment and defeat inevitably.

An Experience with Workmen's Compensation Costs

A paper which the author chose to name "Liability—Compensation—Responsibility" was presented by G. W. Mixter, vice-president Deere & Co., Moline, Ill. It covered an estimate of the compensation cost, in compliance with the Illinois compensation law, on the basis of three years' accident statistics and also the cost entailed since

the law became effective on May 1, this year. He called attention to the fact that compensation laws are almost world-wide, and that employers are not broadly opposed, but indeed are considering whether they can afford to be without wise compensation. The total compensation which would have been provided by the Illinois act for the three years aggregated $33,003.44, or 0.96 per cent. of the pay roll, or essentially 1 per cent., which plus possibly 0.25 per cent. for administration made the cost 1¼ per cent. of the pay roll.

Mr. Mixter's observations on the working of the Illinois act are in part as follows: It does to a large extent prevent suits; it makes ambulance chasing less attractive, and it will not pauperize, because, compensation, or compensation plus wages, or compensation plus compensation plus wages; all, in every case, are less than wages, excepting only in case of fraud, which can be prevented by employer following up the man to whom disability payments are made. Free medical treatment by the employer's surgeon will care for minor injuries promptly, that otherwise often prove serious.

The weakness of the act, he holds, is that it does not provide specified benefits for the serious permanent injuries that are most commonly suffered; such as loss of hand, loss of thumb or finger or part thereof, loss of eye, loss of leg, loss of one or more toes. The benefit is based either on the reduction in earnings or a question of disfigurement and provides settlement by agreement, arbitration or a jury. In other words, if the character of the employee is good and he is well disposed toward the company, settlement is easy; if he is otherwise, the law is indefinite enough to allow him to make trouble. The lack of a public record of men receiving compensation for disability will in some cases permit an employee to draw full wages while receiving benefits from some previous employer.

The Deere & Co. plow department has had something over 300 accidents cared for according to the act which became operative May 1. The estimated cost for all accidents with one case unsettled is $4,500, or 0.84 per cent. of the payroll, or at the rate of $6.16 per man per year. Mr. Mixter in conclusion expressed a belief that an organization sufficiently large should carry its own risk; one less large insure only against extraordinary loss; the very small shop or contractor, he admitted, must insure. The average corporation that has relied on insurance has tended to create an estrangement between capital and labor. The employee has grown to feel that the employer is a heartless corporation without any kindly feelings and relying entirely on an insurance company, which had no interest in the employee.

One member in discussing the paper suggested that in respect to workmen's compensation settlement there will be need to watch the medical end, intimating that extravagant charges are likely to be made, if indeed unnecessary charges are not claimed by the members of the medical profession not adhering to the highest code of ethics. He also suggested that the rate of insurance companies for workmen's compensation are likely to be lower. The discussion also had to do with the question who should engage the doctor, indicating a need for a definite conclusion as to whether or not, for example, the physician should be retained by the employer for the two weeks pending the determination of the extent of the injury and whether or not the selection of the physician should later be left entirely to the injured man. It was agreed that the compensation laws ought to include the domestic servant and the farmer, though it is not now politically expedient to do so.

The Anti-Injunction Legislation

A number of the legislative matters which have received consideration in the last Congress were reported on by George F. Monaghan, who emphasized that matters are now law which ten years ago would have stamped the advocate as an anarchist. In fact, he said, the conditions have so changed that to-day the employer pays compensation independently of his fault. He agreed that some of the legislation is humanitarian, and on that account cannot be questioned.

In referring to the anti-injunction law, he mentioned that the amount of matter on this one question filed with the committee would have taken the time of the entire session for the individual merely to read. Such a measure is referred in the Senate to a committee consisting of, say, fifteen members, who refer it to a sub-committee of five, this sub-committee to report later to the majority and thus finally to the Senate. One is lucky, he said, if he has as many as three of this sub-committee to hear him. He told of one attorney, who after taking weeks to prepare an argument had one listener, and he did not venture to say how many of the fellow members of the committee took the trouble to read the argument. At the same time the argument must be made to controvert that made on the other side of the question.

He emphasized that no injunction can issue without notice to the defendant and that the notice loses effect if it is not served in seven days, and it is of no value if not served in 14 days and expires. The evils lie in that the defendant need only hide for two weeks and it becomes practically impossible for an employer to get an injunction. He related at length the practice of the federal courts in issuing injunctions; he also submitted some statistics to show that the general public had been misled into believing that labor organization men had been persecuted. For example he said that within the past 12 years only 25 injunctions had been granted against labor organizations.

The new law provides that no injunction shall be issued to prevent men from arguing with others. It is a crime for the railroad employer to refuse to carry freight, but the labor organization can commit a crime to the extent that the members of that organization can discriminate against freight which the railroad may be carrying. The law provides also that men can go singly or in combination to persuade another man by peaceful means "wherever he may happen to be," to desist from work. There is a question how broadly one may take the word peaceful, and it is clear that he may go into the man's house or into his employer's shop. If it is as lawful for 100 as it is for one to do this, he held that the doctrine of conspiracy is disregarded. The law also acts to nullify the doctrine of boycott. He added that the House had gone further in asking that when an injunction does issue and the man is found in contempt, the court cannot punish, but must call in a jury. This bill was passed, he added, in spite of the lack of its constitutionality.

Need of Publicity of National Conditions and Affairs

There was considerable sentiment that a live newspaper was needed to give the true status of affairs both with regard to the conditions in the country and conditions affecting or affected by legislation. Considerable interest was taken in the claims that the congressman is very apt to pay close attention to the individual letter or telegram from one of his own constituents and that requests from time to time from offices of the Association to send telegrams or letters on a particular question are of far greater importance than has generally been assumed.

Henry M. Leland, Cadillac Motor Car Company, Detroit, one of the first vice-presidents of the association, admitted that he saw dark clouds on the business horizon in spite of the fact that the country was now enjoying a degree of prosperity greater than this or any other country ever saw. Nevertheless, he continued, there is unrest everywhere. He argued at length on the necessity of the individual employer making himself more of a factor in his own community and taking a vital interest in political affairs. He argued especially, however, for that widespread distribution of facts concerning this country which would be calculated to offset the claims of those leading the general public to believe that conditions were highly damaging to a number of classes. He presented a few statistics to bear out his point, mentioning how these were immediately available to anyone who chose to look them up.

For example, to answer the charge that the farmers have been wronged due to the McKinley and Payne tariff bills, he said that in 1890 the value of farm properties in the United States was $29,000,000,000, while in 1910 the total value of farm property was no less than $59,000,000,000, an increase in value of $30,000,000,000 in the twenty years to the advantage of the "poor robbed farmer." Further, as indicating the general status of prosperity, he mentioned that though the United States comprises but 5 per cent. of the population of the world, there are in its saving banks over $4,000,000,000, or more than in all the

savings institutions of all the rest of the world. There are 10,000,000 depositors and this covers only savings banks. His whole point is that if the picture were only treated as it is, there would be less misunderstanding and less discontent.

The question was also discussed by Charles A. LeFever, of the M. Rumely Company, LaPorte, Ind.; W. B. Leach, Hunt-Spiller Mfg. Corporation, Boston, Mass., and C. E. White, of Deere & Mansur Company, Moline, Ill. It was voted finally that measures be taken for the ten national associations of the general character of the National Founders Association to get together to formulate a plan of combating the misleading statements resulting in legislation of likely disadvantage to the general public.

The 8-Hour Law Regarded Unconstitutional

With regard to the 8-hour law, Mr. Monaghan described it in a word as now applying to Government work as distinguished from the previous law which applied solely to Government works. He claimed that workmen could not work 2 hours on other work for a given manufacturer or contractor after he had already given 8 hours of his time on Government work to his employer. He considered that there was constitutional objection to the bill which would be upheld if properly pushed. He regarded it in the light of the Government's taking property of the manufacturer without due process of law, and that there was justification for a test case.

Business Men to Washington

Under the title of "Business Men to Washington—Why?" C. A. Rathbone, of the Buhl Malleable Company, Detroit, read a paper which emphasized that about 80 per cent. of the House, or 264, were lawyers and of the remainder only seven could be regarded as manufacturers. The subdivision of the rest of the members of the house included 14 farmers, 8 publishers, 4 doctors, 4 editors, 10 bankers and 2 reporters. In the Senate there were no less than 58 lawyers. He emphasized that there was a need of financial interest on the part of legislators in the laws affecting business which they were making. He also charged that there was too much trading of votes, for one section of the country to get something done by similarly trading with a representative from another section. He felt that to let farmers escape the fact that the farming community contributed 45 per cent. of the accidents was a sad commentary on the compensation measure. He urged that the senior member of a given concern ought to give up a considerable part of his time to political and legislative matters.

The Banquet

The banquet, which was held in the Hotel Astor, Wednesday evening, November 20, was presided over by C. H. Gifford, of the American Blower Company, Detroit. There were two speakers, Dr. Lee McCollester, dean of the Crane Theological Seminary, Tufts College, and Dr. George E. Vincent, president University of Minnesota, both of whom made remarkable speeches.

Dr. McCollester preached the doctrine of industry under the title "The Business of Being a Man." He dwelt on the recognition of efficiency in business, in education and in religion, and he pointed to the new note in business, of the appreciation of the human side, as a strong indication of the practical everyday character of religion. There was much satisfaction, he said, to be taken from the emphasis placed not alone on efficiency in leadership but on efficiency of service.

Dr. Vincent responded to "Democracy—Cynicism or Faith." For some time he had his listeners worried over the future of the Republic. He showed how we were a nation of phrase makers. We would fain settle momentous questions with well sounding slogans and popular catch words, on issues thus impossible of fulfillment. We accept them unthinkingly and the few who utter them, an aristocracy, the centralized few, run things. In his inimitable style, with its exceedingly rapid delivery, he compelled agreement with the truthfulness of the blue picture he was painting, viewed however through a haze of humor which had to be recognized and which accentuated the portent of the vision. Before he concluded he dispelled the haze and transformed the picture from a fearful acquiescence to his charge that the average people cannot do things that democracy was supposed to have them do to the complacent and equally true agreement that the capable few define the issues while the many must decide them. Democracy, he concluded, was co-operation between the aristocratic few and the democratic many.

Efficiency in Management

The Thursday morning session of the association was opened with a paper on "Practical Efficiency" by Staunton B. Peck, vice-president Link-Belt Company, Chicago. He said in part:

The essential feature which must exist in the system of management which aims at the highest efficiency is a spirit of friendly co-operation on the part of both workman and management and the recognition and acceptance on both sides, of the fact that exact knowledge of the manner and time in which work should be done must replace traditional methods and individual opinion of either worker or foreman.

The element of efficient operation of which there is the most general knowledge concerns the manner of paying the workmen; and the first step usually undertaken towards increased efficiency is the introduction of some one of the piece rate plans, or plans where an increased production by the worker earns increased pay. Now unless what constitutes a fair day's work is based on accurate knowledge of the machine or tools with which the man works and the motions he uses to accomplish his work, the task set is going to be wrong in the majority of cases. This knowledge can only be obtained by the thorough study of the tools by trained men to be sure that their various functions are properly co-ordinated and to determine their capacities; and by a large number of time and motion studies, with stop watch, of the men, for the purpose of eliminating the useless or waste motions and obtaining records that are fair to the average worker.

The criticism that I think may be broadly made of American factories is a certain impatience, an over-intensity and eagerness to attain results, which causes lack of thoroughness. This is but a natural result of our phenomenal prosperity and a desire to make the most of our tremendous opportunities in the shortest space of time.

The attainment of efficiency in production is shorn of its fruits, if unaccompanied by a corresponding efficiency in the sales organization. No single factor is of more value in promoting this than correct and dependable cost records, and these result automatically where piece rates have been put in use that are properly determined and known to be absolutely right.

The Federal Commission on Industrial Relations

The act creating a commission on industrial relations was discussed by Mr. Monaghan, who doubted that it would accomplish very much. He admitted that it was a potential evil, as was brought out in President Briggs's address referred to on page 1267. The commission is to inquire into the general condition of labor; into the existing relations between employers and employees; into the effect of industrial conditions on the public welfare and into the rights and powers of the community to deal with them; into conditions of sanitation and safety; into the growth of associations of employers and wage-earners and the effect of such associations upon the relations between the employers and employees; into the extent and results of collective bargaining; and into methods for avoiding or adjusting labor disputes. It is also to ascertain the underlying reason for unrest.

Its scope is confined to making recommendations, but their effect on the actions of Congress cannot be too greatly magnified. It must be remembered, Mr. Monaghan urged, that it has power to subpoena people and papers and it is important that careful watch be kept to learn who is likely to constitute the commission. He urged that steps be taken by the employers to see that they are represented by manufacturers, for example, who are not given to bargaining at the expense of the consumer to avoid strikes. He urged that there should be co-operation with similar organizations to the National Foundries Association. It was voted that this suggestion be taken up by the council at once.

Fire Prevention

On Thursday afternoon the convention listened to an address by Franklin H. Wentworth, secretary of the National Fire Prevention Association, Boston, who presented

a strong case of the need of more attention to preventing fire in the factory. He presented a few startling statistics, for example: The annual fire loss per capita in six countries of Europe is 33 cents, while in the United States it is no less than $3; in the city of Glasgow the annual fire loss figures at $325,000, while in Boston, a city of about the same size, the annual fire loss aggregates $2,000,000; similarly Berlin, with about the same population as Chicago, has a fire loss of $175,000, against $5,000,000 in the latter city. In Berlin the cost of the fire department for a year was $300,000, while in Chicago it was $3,000,000.

He felt that one of the reasons we are suffering an annual fire loss in the United States of $250,000,000 is that we have had too much reliance on unlimited natural resources and only of late have thought of conservation. We have not practiced sane methods of building and this applies not solely to the wide use of wood. It is not generally apprehended that after all the individual has to pay his $3 fire tax, though indirectly, and incidentally it does not include the cost of fire departments. We are careless with the match, and one is even angry if he cannot touch a match on awakening in the middle of the night.

Fire insurance, he continued, is at best a gamble, as long as a city may be destroyed over night. Fire insurance companies make their money not by underwriting, but by their investments. He made a plea for metal window frames and protective coverings to the windows so that the tall building, for example, does not become a horizontal flue in the case of a large conflagration. New York City spends $8,000,000 for fire extinguishment against $12,000 for the study of fire prevention. He paid a tribute to the automatic fire sprinkler. He suggested the wisdom of individual responsibility for fire spreading into an adjoining building.

The work of the fire department should be expanded to cover inspection to prevent fire, with the result that much rubbish now the cause of fire be cleared up. The close study would then give the department a familiarity with conditions that is not now the case, such as places of likely danger and how and where materials are stored.

Election of Officers

The convention came to a close with the election of officers and district committees. The nominations were made by T. L. Richmond, Buffalo Scale Company, Buffalo, N. Y., as chairman of the nominating committee, and the officers were re-elected and only occasional changes made in the district committees, as follows:

President, O. P. Briggs, H. E. Wilcox Motor Car Company, Minneapolis; vice-president, Justus H. Schwacke, William Sellers & Co., Inc., Philadelphia; secretary, J. M. Taylor, 29 South La Salle street, Chicago; treasurer, Chicago Savings Bank & Trust Company, Chicago.

First District Committee: Thomas W. Fry, Sullivan Machinery Company, Claremont, N. H.; A. F. Corbin, Union Mfg. Company, New Britain, Conn.; E. A. Jones, E. D. Jones & Sons Company, Pittsfield, Mass.; D. K. Bartlett, Builders' Iron Foundry, Providence, R. I.; Dr. John A. Mead, Howe Scale Company, Rutland, Vt.

Second District Committee: C. A. Chase, Syracuse Chilled Plow Company, Syracuse, N. Y.; William H. Barr, Lumen Bearing Company, Buffalo; Albert J. Glass, Adriance, Platt & Co., Poughkeepsie, N. Y.; F. C. B. Page, E. W. Bliss Company, Brooklyn, N. Y.; James Eastwood, Benjamin Eastwood Company, Paterson, N. J.

Third District Committee: Thomas Shipley, York Mfg. Company, York, Pa.; M. Griswold, Jr., Erie Works, General Electric Company, Erie, Pa.; W. M. Gardner, Finch Mfg. Company, Scranton, Pa.; Stuart R. Carr, Stuart R. Carr & Co., Baltimore, Md.; Edward Kneeland, Frank-Kneeland Machine Company Department of the United Engineering & Foundry Company.

Fourth District Committee: H. J. Boggis, Taylor & Boggis Foundry Company, Cleveland; C. H. Gifford, American Blower Company, Detroit; William Gilbert, Buckeye Foundry Company, Cincinnati; E. B. Perry, Industrial Works, Bay City, Mich.; C. E. Blue, Wheeling Mold & Foundry Company, Wheeling, W. Va.

Fifth District Committee: Staunton B. Peck, vice-president Link-Belt Company, Chicago; J. H. Steedman, Curtis & Co. Mfg. Company, St. Louis; James F. Larned, Rock Island Plow Company, Rock Island, Ill.; E. E. Baker, Kewanee Boiler Company, Kewanee, Ill.; S. B. Lafferty, Red Jacket Mfg. Company, Davenport, Iowa.

Sixth District Committee: Oliver Crosby, American Hoist & Derrick Company, St. Paul, Minn.; Theodore O. Vilter, Vilter Mfg. Company, Milwaukee; J. L. Record, Minneapolis Steel & Machinery Company, Minneapolis; Frederick Robinson, J. I. Case Threshing Machine Company, Racine, Wis.; J. A. Vail, Fairbanks-Morse Mfg. Company, Beloit, Wis.

Seventh District Committee: C. H. Waterous, Waterous Engine Works Company, Brantford, Ont.; J. A. Kilpatrick, Canada Iron Corporation, Ltd., Hamilton, Ont.; George W. Watts, Canada Foundry Company, Ltd., Toronto, Ont.; William Harty, Jr., Canadian Locomotive Company, Ltd., Kingston, Ont.; W. M. Gartshore, McClary Mfg. Company, London, Ont.

Eighth District Committee: W. D. Tynes, Hardie-Tynes Mfg. Company, Birmingham, Ala.; E. H. Sholar, Chattanooga Implement Mfg. Company, Chattanooga, Tenn.; F. H. Crockard, Tennessee Coal, Iron & Railroad Company, Birmingham, Ala.; E. Y. Hartwell, Hartwell Iron Works, Houston, Texas; John H. McClure, Phillips & Buttorff Mfg. Company, Nashville, Tenn.

Ohio Liability Premium Rates Reduced

After a study of the hazards and insurance rate problems during the eight months that the Ohio workmen's compensation law has been in operation, the Liability Board of Awards of that State has made a material reduction in the premium rates. These reductions are from 15 to 65 per cent. from the rates established when the law went into effect. In the various metal working industries the reduction is 15 per cent., this reduction being smaller than that made for other trades. The liability rate on blast furnace employees is reduced 25 per cent. The largest reduction, which is 65 per cent. from the present rate, is for printers.

Owing to the fact that the law leaves it optional whether employers shall pay the State premium and operate under the law, there has been strenuous competition between the agents of liability companies and the solicitors employed by the State. The latter have been at considerable disadvantage, owing to the higher rates made necessary by the protection afforded to workmen under the State law, but it is expected that with the reduction there will be a large increase in the number of concerns that will subscribe to the State insurance fund. In the operation of the Ohio law it is the purpose to furnish insurance at actual cost, and, as the rates first established were found to be considerably higher than necessary, this revision has been made. A further reduction is expected within the next year or two. Two important manufacturers in sheet metal lines have just decided to operate under the State insurance fund. These are the Deforest Sheet & Tin Plate Company and the Standard Boiler Company, Niles, Ohio.

The Judson Mfg. Company's Business

The Judson Mfg. Company, 819 Folsom street, San Francisco, Cal., according to a recent circular, is operating a structural shop with a capacity of over 1000 tons per month; a rolling mill manufacturing all sizes of double refined bar and other merchant iron; a foundry and pattern shop, with exceptional facilities for all kinds of castings and patterns; one of the best equipped machine and blacksmith shops on the Pacific coast, making dredger work and machine work of every description, and a bolt shop turning out all sizes of bolts, lag screws, spikes, rivets, drifts, etc. The company carries a large stock of structural material. Its works are at Oakland and Emeryville. The Oakland City Hall, the largest steel structure on the Pacific coast, taking 3600 tons of structural steel, was erected by this company.

The foreign trade of the United States will cross well over the four billion dollar line in the year which ends next month, according to the Bureau of Foreign and Domestic Commerce. Its highest former record was 3,626 million dollars in 1911, and it only crossed the three billion dollar line for the first time in 1906 and the two billion line in 1899. The bureau also reports that October's foreign commerce exceeded all previous records in the history of the country. It was the largest month ever known in both exports and imports. The value of the exports was $254,696,985; imports, $177,995,830; excess of exports, $76,701,155.

Free Entry of Ship Materials

WASHINGTON, D. C., November 26.—Regulations to carry into effect that provision of the Panama Canal act admitting free of duty to the United States materials for the construction and repair of American ships have been completed, and will be formally promulgated. The Treasury Department has made public some of the important features of the regulations, these constituting the construction to be placed on the act. Among other things, it has been decided that machinery will not be entitled to free entry. Another important construction is that the term "outfit and equipment" will be held to include not only original outfitting and equipment but also renewals and replacements. The subject of iron and steel articles and machinery has been the most difficult one to handle in connection with the act, officials of the Treasury Department say. It was reported that Assistant Secretary Curtis, in charge of customs matters, and Secretary MacVeagh had had a serious disagreement on that phase of the subject, but this is denied.

The Treasury Department holds that the provision applies to vessels of 5 tons and over, and to include all kinds of vessels, both Government and private.

After the regulations were completed they were referred to the President, who approved them.

The substance of the construction to be placed on the provision with regard to iron and steel products and machinery is contained in a summary issued by the Treasury Department. Provision is made for reliquidating entries of merchandise imported on or after August 24, 1912, the date of the act, and for free entry of merchandise entered in bond on or after that date for which no permit of delivery has been issued. The summary of the Department is as follows:

"1. A vessel will be defined as any water craft entitled to be documented under the laws of the United States, and similar craft for which there are no such requirements, such as battleships, revenue cutters and Government vessels. This will include every vessel of over 5 tons, whether used by the Government or for commerce or pleasure.

"2. Machinery will not be entitled to free entry. Included in the term 'machinery' will be auxiliary machinery such as pumps, steam winches, hoisting engines, electric motors and generators, condensers, etc.

"3. The term 'outfit and equipment' will be defined as including all portable articles not permanently incorporated in the hull or machinery, and will include rigging, tackle, boats, life-saving apparatus, wireless apparatus, searchlights, lamps, bedding, furniture, tableware, small arms, etc., but will not include consumable supplies such as coal, food, medicines, etc.

"4. The term 'outfit and equipment' will also be held to include not only the original outfitting and equipping but also renewals and replacements.

"5. Materials will be defined as including merchandise suitable for use in the construction or repair of a vessel or its machinery to be incorporated therein after having undergone a process of manufacture subsequent to importation, or in its condition as imported, provided it has been purchased in the open market and was not constructed or fabricated on a special order or after a special design. This will include raw materials such as pig iron and lumber, rough forgings and castings, but not finished ones, nuts, screws, bolts, steel plates, ship knees, flooring, etc., and other things which, though completed articles, are useful as parts in the construction of something else.

"6. The word 'articles' is defined as including only such articles as are suitable for use in their condition as imported in the outfit and equipment of a vessel, but such articles may be fitted, polished, painted or otherwise improved in condition or fixed in place subsequently.

"7. Shipbuilding materials may be entered for warehouse and withdrawn as desired within three years from date of importation free of duty upon compliance with the regulations.

"8. The regulations provide that materials may be used or manufactured in a customs district other than that in which entry is made, and provisions are also made for the disposition of unused portions of importations.

"9. Merchandise entered under this act is required to be appraised and classified, but the liquidation of the entry will be suspended pending the production of evidence of compliance with the regulations.

"10. Various forms of application, bonds and affidavits, to show the disposition made of the merchandise, are provided.

"11. The regulations further provide that, subject to compliance with the regulations liquidated entries of merchandise imported on or after August 24, 1912, may be reliquidated free of duty where the liquidation has not become final, and that free entry will be granted to merchandise entered in bond on or after that date for which no permit of delivery has been issued. W. L. C.

The Hadfield Method of Producing Sound Ingots

Without the knowledge of Sir Robert A. Hadfield, G. Charpy, of the Cie. des Forges et Acieres de Chatillon-Commentry et Neuves-Maisons, Montluçon (Allier), the well-known French metallurgist, after reading the papers, regarding "A Method of Producing Sound Ingots" and "A New Method of Revealing Segregation in Steel Ingots," presented at the Leeds meeting of the Iron and Steel Institute, decided to test the methods for himself, and proceeded to make an ingot of comparatively large size, weighing about 25 tons. The results obtained are set forth in an illustrated circular just received from Sir Robert.

M. Charpy states that the Hadfield method of feeding the upper portion of the ingot in the special manner described in the papers above mentioned, namely, sand head, air blast, charcoal and insulating layer of slag, appeared to him to constitute a particularly simple and practical solution of the problem met with in steel manufacture, and to overcome the difficulties met with as regards piping, also reduce segregation and avoid the large percentage of waste material. The composition of the 25-ton ingot thus treated was as follows: C., 0.40; S., 0.02; P., 0.04; Mn., 0.45 per cent. The material also contained a small percentage of nickel.

M. Charpy found that in order to eliminate all faults and sponginess in the ingot in question it was only necessary to cut off about 12 to 12½ in. from the upper part, in other words, about one-twentieth of the ingot, as against one-third, which is the proportion of discard ordinarily required. The analyses taken of the material at different parts of the ingot showed it to be free from segregation. Drillings were taken on a center line, commencing at the top, and showed sulphur, 0.012 to 0.028; phosphorus, 0.038 to 0.045. This is a very narrow range.

In an accompanying letter to *The Iron Age* Sir Robert says:

"The results are somewhat remarkable, and are an independent confirmation of what has been urged in my own researches. The information sent with regard to this 25-ton ingot shows that large masses of steel can be produced perfectly sound, the troubles arising from segregation avoided, and the waste reduced to a very low figure—in this case only 5 per cent.

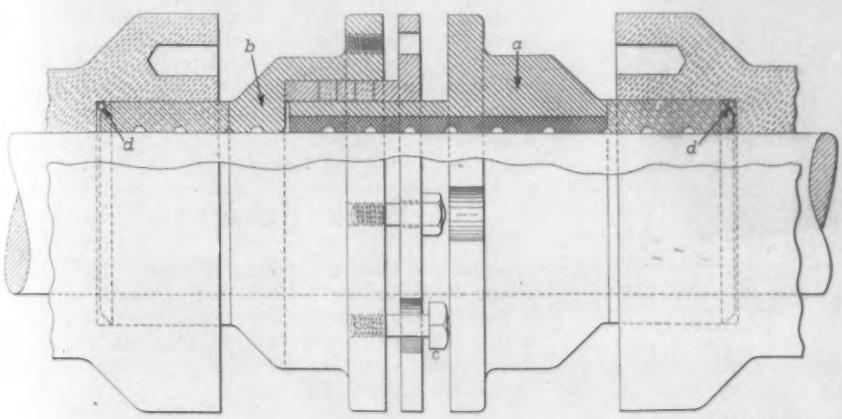
"While various contributions to metallurgical discussions are always interesting, in some of the comments which appeared recently in the technical journals with regard to the Talbot experiments and my papers, the whole point so prominently brought forward by me seems to be missed, namely, that my system insures every ingot shall be alike—that is, quite sound—also that the segregation is reduced to remarkably low limits, and finally that the waste in the product is largely reduced. For example, a method which depends upon squeezing the ingot while fluid must always be uncertain, for if only one ingot in a thousand such as used for rail manufacture is unsound, and such ingot produces a bad, unsafe rail, some uncertainty will exist as at present; in fact, we are very little better off. My system insures absolute certainty, as every ingot must be sound. Therefore material such as produced therefrom must possess increased safety."

That the three principal railroads of Canada have this year placed orders for no less than 43,164 freight cars and 727 locomotives is one of the facts revealed in a story on the railroads and the crop movement in the Toronto Monetary Times. It is shown that the Canadian railroads have loaded every locomotive and car company in Canada with orders for new equipment which will keep them busy well into 1913.

An Improved Type of Metallic Pump Packing

Although classed as an all-metal packing for use in outside center packed plunger pumps, the new device of the Metallic Packing & Mfg. Company, Elyria, Ohio, is not strictly speaking a packing. It really is a continuous connecting sleeve between two cylinders, fitting the plunger closely and having water grooves therein which cause reversal of the flow of any fluid that may tend to pass through the sleeve.

The gland shown in the accompanying engraving is simply for a slip joint and no motion occurs in connection with the square hydraulic packing. This is a permanent fixture, and, it is pointed out, will only have to be renewed in case of accident. The slip joint is made between the parts *a* and *b* so that they may be forced apart by the set screw *c* after being placed between the cylinders and firmly seat the gaskets *d d* at the bottom of the boxes which are filled with the bushing. When installed on pumps of this character the sleeve can be made from 12 to 18 in. long, which, it is pointed out, is ample to insure long life and efficient service. If the wear should become enough to impair the efficiency of the pump it is simply necessary to reline the part *a*.



The New Martell Metallic Packing for Use on Outside Center Packed Plunger Pumps Made by the Metallic Packing & Mfg. Company, Elyria, Ohio

In a test made to show the reduction in friction effected by the use of this packing it is stated that in a boiler feed pump having 5-in. plungers, the throttle was open one and one-half turns before the packing was applied. After the packing was applied the throttle was only opened one-third of a turn, and it is stated that the operation of the pump was steadier and more efficient.

Grinnell Sprinkler Head Tests

The General Fire Extinguisher Company, Providence, R. I., uses the utmost care in the manufacture of its automatic sprinkling apparatus. After a most rigid inspection for blow holes or other imperfections, every Grinnell sprinkler head is given two rigorous tests. The heads are placed, one gross at a time, in a hydraulic testing apparatus in which the pressure is run up to 400 lb. per sq. in. Occasionally there is a hiss, and a tiny stream of water shoots into the air. The offending head is thrown into the scrap pile. These, however, are few. The heads which have passed this test are taken to another machine where they are subjected to a still more severe trial—that of air pressure. The apparatus is submerged in soapy water and the pressure turned on. The operator gazes steadfastly at the surface of the water; generally this remains smooth and unbroken and the heads are passed, but sometimes a bubble shows on the surface, and the head which developed the leak is thrown into the scrap pile. The product which passes this test is pronounced perfect.

The Chase Rolling Mill Company, Waterbury, Conn., is arranging for the installation of additional electrical apparatus in the Waterville plant. In the installation are included a 750-kva. Curtis turbo-generator with 35-kw. exciter and two direct generators of 25 and 50-kw. capacity. The apparatus is being obtained from the General Electric Company.

A Boring Bar Holder of a New Design

With a view to eliminating the spring which is claimed to be present in boring bar holders when a heavy cut in a deep hole is being taken, the Krieger Tool & Mfg. Company, Grand Rapids, Wis., has designed a new type of boring bar holder. This holder has two shanks, one of which is used in small and light work, while when heavy work is being done, the ring is removed from the tool post and one shank placed on each side of the post with a Y clamp passing through the slot of the tool post. The bottoms of the outside shank have projecting lugs which fit in the tool post slide and keep the holder from slipping. These holders are made for use in 16, 18 and 20-in. lathes and will clamp any size of bar from ¼ to 1½ in. A range of adjustment from 1 in. above to the same distance below the center of the lathe is provided.

The New Holder for Boring Bars Made by the Krieger Tool & Mfg. Company, Grand Rapids, Wis.

The Trumbull Steel Company, of which Jonathan Warner is president, now building a sheet and tin plate plant at Warren, Ohio, expects to have it in operation about next May. The plant will contain six hot sheet and six tin mills.

The Otis Steel Company's New Plant

The Otis Steel Company, Cleveland, Ohio, has purchased 200 acres in the upper Cuyahoga River Valley, on both sides of the river, for a new steel plant. The site is advantageously situated and is about 2½ miles from the Public Square, Cleveland. Some months ago this company announced its intention to build a new plant and sought permission from the Government to fill in along the lake front at its present plant in order to secure sufficient room. This permission was not granted.

The tract purchased extends from Jennings road southeastward to the new dock line planned by the city, which will be about 800 ft. east of the Baltimore & Ohio Railroad tracks. Preliminary drawings for the plant have been prepared and definite plans are now being worked out. As soon as they are decided upon, the work of erection will be started. The new plant will consist of open hearth furnaces and light and heavy plate mills. The company plans eventually the erection of blast furnaces.

At present the site does not touch a navigable stretch of the Cuyahoga River, but upon the establishment of a new dock line and the digging of a new channel planned by the city the company plans to tunnel under the Baltimore & Ohio Railroad and run its own railroad from the plant to the wharves along the channel. The blast furnaces that it proposes to erect later will be located along the new dock. Until these are built the company will be able to get hot metal from nearby furnaces. It does not intend to abandon its present plant but that site may eventually be used only for its steel casting foundry.

The G. Drouvé Company, Bridgeport, Conn., furnished its Straight Push sash operator to manipulate the Detroit-Fenestra steel sash and ventilators in the new plant of the Massillon Bridge & Structural Company at Massillon, Ohio, which was described in *The Iron Age* of November 21.

Recently Developed Grinding Machines

Two new machines have been recently added to its line by the Gardner Machine Company, Beloit, Wis. There are a number of interesting features embodied in the

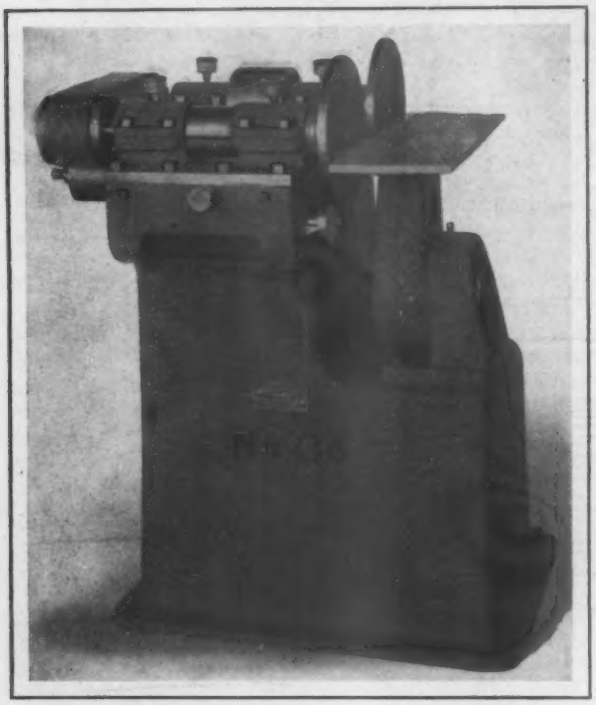


Fig. 1—A Disk Grinding Machine with Two Parallel Spindles Built by the Gardner Machine Company, Beloit, Wis.

construction of both of these machines, and one of them might perhaps be better classed as a special grinding machine rather than a regular one. Fig. 1 is a view of this so-called special machine, while Fig. 2 illustrates the builder's No. 2 machine equipped with lever feed tables and ring wheel chucks.

The machine shown in Fig. 1 is interesting from the fact that it is claimed to be the first disk grinding machine ever made with the two spindles set parallel with each other. This machine was designed to generate accurately and rapidly two surfaces which must be parallel with each other but in different planes where it is necessary to have these planes at an exact distance from each other. As will be noticed from the engraving, the rear spindle is set in the solid base of the machine and is driven by a belt connection from a countershaft in the usual way. This spindle has no lateral movement, and is provided with a pulley on its outer end which drives the front spindle through a belt connection. The tension on the short connecting belt is maintained by a weighted idler pulley. The front spindle is set in a head which is adjustable laterally in the base and means for close adjustment are provided by a graduated handwheel which is located underneath and back of the front disk wheel. The work is supported by a table which can be swung across the face of the wheel but is generally used fixed in the position illustrated. With the exception of the two spindles, the construction follows the builder's regular standard practice.

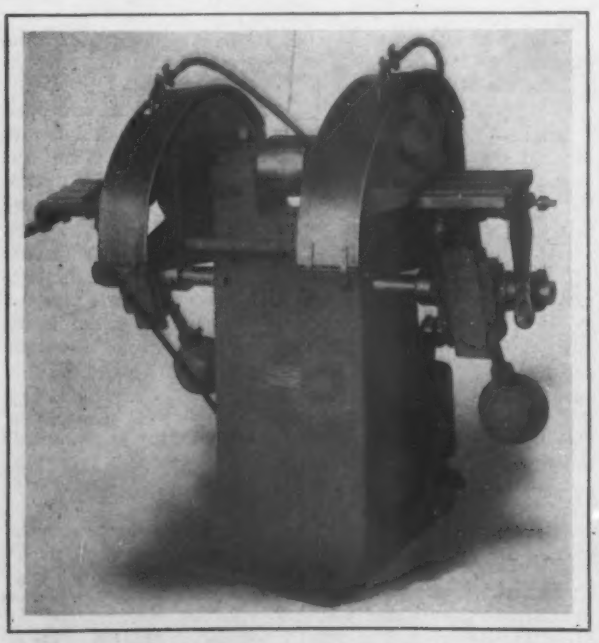


Fig. 2—Another Recently Designed Grinding Machine Equipped with Lever Feed Tables and Ring Wheel Chucks

The builder's No. 2 machine equipped with lever feed tables and ring wheel chucks, as illustrated in Fig. 2, possesses as its novel features the water shields or hoods and the angle plates for holding the work on the lever feed tables. The construction of the hood is simple, and when it is necessary to adjust or change the ring wheels it can be readily removed. Access can be had at both sides for setting and removing the work on the holder. It is pointed out that as the result of a number of tests it has been found that with the wheels running at a high speed it is possible to flood them with water from a pump set at the rear of the machine without throwing any water into the air, it practically all being returned to the pump. The special angle plates upon which the work is held have raised edges at the back and both sides, which return the water falling upon them to the pump.

Book Reviews

Cementation and Case-Hardening of Steel ("La Cementazione del l' Acciaio"). By Dr. F. Giolitti, professor in the Royal Technical University at Turin. 6½ x 10 in.; XI + 506 pages; 155 illustrations. Price, in paper covers, 15 lire. Published by the Unione Tipografico Editrice Torinese, Turin, Italy.

It is noteworthy that the first complete book on case-hardening should come from the pen of an Italian writer and be of such an excellent character. Dr. Giolitti, however, is already known to scientific metallurgists because of the pioneer work that he and his students have carried out on case-hardening by means of gases. His book is divided into two parts, each of five chapters. The first part deals with our knowledge of the subject and the second with the industrial applications of this knowledge. Chapters 1 to 3 of Part 1 take up in detail the work of various workers down to the close of 1907, and full references are given. Chapter 4, of 118 pages, takes up the more recent work and consists very largely of descriptions of the research work and the results obtained by the author and his collaborators. The whole matter is summed up in chapter 5, which is on the present condition of our knowledge of the processes of cementation and case hardening.

The second part opens with a short chapter on the methods used for the total carburization of wrought iron and mild steel, such as those used in making blister steel. It is followed by a long chapter on case-hardening, different sections dealing with case-hardening by means of solids, liquids, gases and special agents. Views and detailed drawings of suitable furnaces are given, together with the mixtures and gases recommended, and the whole treatment of the subject is essentially practical. Next come chapters on the heat treatment of the case-hardened products and the methods for controlling the process such as the choice of the raw materials, pyrometry, etc. Last of all are given details of the important patents dealing with case-hardening.

The book as a whole is very good and a great credit to Dr. Giolitti and the Italian metallurgists, of whom we hear very little. The illustrations and printing are excellent and the former are very numerous. Although the language used is only partly familiar to most workers here, because of their early studies in Latin, yet enough can be made out from the diagrams, references and illustrations to show the importance of the book, and to all those with even a rough working knowledge of Italian it will prove very helpful. G. B. W.

Traité **de Métallographie.** By Felix Robin. Preface by M. Floris Osmond. 6½ x 10 in.; 464 pages; 244 illustrations and diagrams; 460 photomicrographs. Published by A. Herman et Fils, Paris. Price, bound in cloth, 30 francs.

The literature of the modern science of metallography is growing very rapidly and the author of the present work deserves great credit, for he has brought together practically all the results obtained by the many workers in this subject. It is, however, far from being merely a dry compilation, for it is enlivened throughout by the author's observations and criticisms and the impression produced is that almost everything described has been tested by him. The whole field of metallography is covered, including the various alloys, iron and steel and slags. The greatest importance is laid on microscopical examination and investigation, which is evidenced by the large number of excellent photomicrographs, and in this respect iron and steel are given the preference. The book, therefore, will probably be of more value to iron and steel workers than to those interested in the non-ferrous metals, although the latter will find their own subjects treated quite fully.

The first two chapters deal with the various methods of examination and testing used in metallography, and the details of the preparation, attack and examination of microscopic specimens. Chapter 3 takes up constituents and equilibrium diagrams and gives a long table by means of which specimens can be qualitatively estimated according to the appearances noted under the microscope. It is similar in plan to the ordinary chemical qualitative tables. Chapter 4 is on microchemical qualitative analysis, which is now extensively used in chemistry and pharmacy, but has not been applied to metallography. After a chapter on the general constitution of metals comes one in which the principal constituents of alloys are taken up in great detail. Not less than 80 pages are devoted to those of iron and steel. Chapter 7, over 100 pages, then deals with the structure of ordinary and special steels, iron alloys, alloys of copper, lead, tin, zinc and the other non-ferrous metals. Chapter 8 shows how metallography is applied in industrial operations and also takes up fractures, microscopy, forging, rolling, case-hardening and welding. The final chapter is very interesting, containing a special article by P. Gartner on the microstructure of metallurgical slags, and further cases are given where the microscope can be used for the examination of materials.

The language used throughout is clear and interesting and the detailed descriptions of methods and the results obtained make a book that is essentially practical and that merits a place in the working library of every non-ferrous and ferrous metallurgist. G. B. W.

The Theory and Practice of Enameling on Iron and Steel. By Julius Grünwald. Translated by H. H. Hodgson. Cloth bound; pages, 131; 6½ x 9 in. Published by J. B. Lippincott Company, Philadelphia. Price, $2.

The use of enameled iron and steel ware has grown to such proportions as to absorb annually large amounts of iron and steel. The literature of the practice of this kind of enameling is not extensive and is mostly scattered through the proceedings of various societies and the columns of technical journals. The present volume, which deals with French and German practice, is therefore assured of a hearty welcome. The writer is a German technologist of wide experience in enameling, who is at present manager and chief chemist at a large works in France. The translator is lecturer and research chemist at the municipal technical college, Bradford, England.

The book opens with a short introduction dealing with the present and growing importance of the industry, followed by an important chapter on the raw materials, including those used in making the enamels, and the iron and steel to be treated. On the whole it is excellent, but some errors have crept in. For example, the specific gravity of cryolite is wrongly given as 8.5 to 8.9, and limonite, which is a hydrated oxide of iron, is said to be MnO_2 and to be known as pyrolusite. There is also no special kind of coal known in English as pit coal; evidently bituminous coal is meant. The short section of six or seven pages on the steel and cast iron used in making enameled ware shows plainly that either the author or translator is not familiar with the subject, and this section needs careful revision.

The preparation of the enamel is dealt with in a very thorough and practical manner. Formulas are freely given, and the methods of mixing, grinding, fusion and subsequent treatment are explained in detail. Chapter IV takes up the preparation of the crude ware for enameling, and following it are two chapters on the process of enameling and firing the enameled ware. The latter contains some very practical "remarks on mistakes in manufacture and their possible causes."

Next come two short chapters on the decoration of enameled objects, taking up enamel painting and photoceramics. The book closes with some pages of statistics and general information and there is an appendix dealing briefly with the history of the enamel arts and of enamel ornamentation. Although the English used sometimes is not altogether clear, yet the value of the book is not greatly lessened, and it will be found to be of great interest to those engaged in this special branch. G. B. W.

Hygiene for the Worker. By William H. Tolman, Ph.D., and Adelaide Wood Guthrie. Cloth; pages, 231. Publisher, American Book Company, New York, Cincinnati and Chicago. Price, 50 cents per copy.

The authors of this volume, which is the second in Crampton's Hygiene Series, are Dr. William H. Tolman, director of the American Museum of Safety, New York City, and Miss Guthrie, of the Department of Research in the same institution. The editor, C. Ward Crampton, M.D., is director of physical training of the Department of Education, New York City. The work, while designed for boys and girls from 13 to 18 years and for vocational, industrial and manual training high schools, is adapted to the needs of all workers, old and young. It is a thoroughly practical treatise which teaches hygiene, not in the usual manner of describing the functions of various portions of the anatomy, but by telling precisely how to use them and to develop them in a manner to secure the highest condition of healthful life. Specially prepared drawings are given which aim to tell the story concisely. The large collection of working models, special reports and photographs of the American Museum of Safety and the collections and exhibits of the International Exposition of Hygiene at Dresden in 1911 have been drawn upon extensively in the work of informing the reader how to take the very best care of his health.

American Society for Testing Materials.—The proceedings of the American Society for Testing Materials and its formidable list of specifications for engineering materials are published under one cover this year and form a book of no less than 600 pages. Nearly one-half is given over to the standard specifications, now adopted to the number of 53, covering structural steel, steel rails, steel forgings, iron and steel castings, pig iron, etc. Detailed information can undoubtedly be obtained by addressing the secretary of the society, Prof. Edgar Marburg, University of Pennsylvania, Philadelphia, Pa.

Brooklyn Engineers' Club.—The 1911 annual of the Brooklyn Engineers' Club, bound in cloth with 185 pages and numerous illustrations, has been published by the club, 117 Remsen street, Brooklyn, N. Y., and is sold for $2. In addition to the proceedings, report of the board of directors, list of members, etc., it contains seven papers on various subjects, including ventilation, hydroelectric development and installation, high-tension electric transmission lines and all-metal construction of doors and trim for fireproof buildings.

The Russian Steel Trade.—The development of the Russian steel trade in the past four years is shown in the following table, which represents the orders taken by the Prodamenta, or Russian steel combination, in the first nine months of each year, stated in metric tons:

	1909	1910	1911	1912
Plates	110,400	142,200	186,000	207,000
Beams and channels	117,900	180,000	232,000	254,000
Bands and axles	17,400	27,700	40,000	38,600
Bars	519,000	683,000	732,000	701,000
Rails	.....	237,000	323,000	486,000
Totals	764,700	1,269,900	1,513,000	1,686,600

ESTABLISHED 1855

THE IRON AGE

Published Every Thursday by the

David Williams Company

239 West 39th Street New York

W. H. Taylor - *President and Treasurer*
I. A. Mekeel - - - *First Vice-President*
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Branch Offices

Chicago: Otis Building Philadelphia: Real Estate Trust Bldg.
Pittsburgh: Park Building Cleveland: American Trust Building
Boston: Compton Building Cincinnati: Mercantile Library Bldg.

Entered at the New York Post Office as Second-class Mail Matter

Subscription price: United States and Mexico, $5.00 per year; to Canada, $7.50 per year; to other foreign countries, $10.00 per year.

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Railroads Prosperous

One cannot observe the freedom with which railroads have been buying in the past 13 or 14 months without reflecting that the developments indicate the substantial accuracy of the position taken by the Interstate Commerce Commission and shippers in general in the "advanced rate cases," the decisions in which were handed down in February, 1911. Apparently the railroads allowed only a decent time to elapse and then began to buy with greater freedom than had been manifest since the halcyon days of 1906, when similar pairs of events were so common, the first event in the pair being the flotation of securities, the second the placing of large orders.

Railroad expenditures in that period were dependent upon railroad credit. The railroads made purchases if they could borrow the money. In the "advanced rate cases" their plea was that their credit would be ruined. One of the contentions of the shippers was that the railroads ought to be able to earn more money at existing rates, by conducting their business more economically. The Interstate Commerce Commission took the position that as density of traffic increased better earnings per unit of business should follow. In strong language, at the Chicago hearing, Commissioner Lane pointed out to the railroads then testifying that their arguments were along the line that as business increased the cost of transacting it increased, and there was no hope for a satisfactory solution if the problem were to be viewed from such a standpoint. That was some two years ago, and the railroads have evidently been following Commissioner Lane's suggestion.

By far the larger part of the present railroad expenditures are being made out of earnings, and that is as it should be. The Interstate Commerce Commission holds in substance that this should be the case, and by no means holds that the railroads should earn only the cost of service, plus a meager return upon investment. In substance it admits that the railroads should be allowed to earn a surplus for improvements. The point of difference was that the railroads wished to earn a surplus for the purpose of improving their credit and then borrowing more money, while the commission wished the railroads to earn a surplus and use it in the betterments. Really the commission's viewpoint was, in the long run, the more liberal one to the railroads. It may well be that the railroads did not actually contemplate such a procedure as might have been thought from some of the arguments put forth; but in the heat of the argument, at least, some ground was furnished for a theory that the railroads desired to conduct a sort of pyramiding operation.

In such railroad expenditures as involve the purchase of steel the natural development of the years is in the direction of making the purchases as part of the ordinary conduct of business, rather than in the direction of strictly new construction. Thus in rails, as has been pointed out before, the condition of a quarter century ago was one of buying rails for new line almost exclusively. Rails were not wearing out to any extent, and the amount of second track, siding and yard track was small relative to main line track. To-day rails are wearing out rapidly, not because the rails are poor, but because the density of traffic has greatly increased, and yard, siding and second track are being required more and more in proportion to main line track. In the acquisition of steel cars somewhat the same development has occurred. Early in the history of the steel

car the railroads bought large numbers as a plain increase to facilities, as wooden cars were wearing out rapidly; but to-day there are many steel cars in service, practically none being worn out entirely, while the proportion of wooden cars to the total is much smaller, and as they wear out and their replacement by steel cars is a much less formidable operation, for the railroads have much larger total earnings to furnish surplus earnings and contributions to renewal accounts. Thus current railroad purchases, while large, do not necessarily involve the flotation of fresh securities which the railroads were claiming two years ago was indispensable to any expansion.

Class Interest or Common Interest?

The political campaign which ended three weeks ago was the climax of a period of denunciation that has probably not been paralleled in the discussion of national economic questions. Now that a President has been elected, it might be concluded that there will be rest from strife, that the bitterness of campaign attacks will disappear and that the country will go unitedly about its business with a singleness of purpose that has long been wanting. We could well wish the situation warranted such optimism. Business conditions assuredly are satisfactory in many ways. The factors of strength are so familiar from frequent iteration that they need not be recapitulated. But are there any real indications that an era of good feeling is to succeed the detraction and accusation that so long have been marked in our national life? If that question could honestly be answered in the affirmative it would mean far more to the country than bumper crops, more than full operation of steel works, more even than full employment to every man willing to work.

Senator Root pointedly called attention to some of the misunderstandings and differences that are real obstacles to a confident forward movement in industry when he said at the annual dinner of the Chamber of Commerce of the State of New York last week:

> There are hundreds of thousands of people outside the great industrial communities who think you are a den of thieves; there are hundreds of thousands of people who think the manufacturers of the country are no better than a set of confidence men. Why, we have before us now the great financial problems of the country, and this is what stands in the way of their solution: It is that the men that understand the finances of the country, the bankers and the merchants engaged in great operations, are under suspicion. Great bodies of people will not accept what they say regarding the subject of finance, a subject complicated by all the currents and movements of finance throughout the world; they will not accept what the experts say, what the men who understand the subject say, because they do not believe their motives are honest. So that the only one who can be heard is the man who does not understand the subject. How are we to reach any conclusion in that way?
>
> On the other hand, there are many in this room tonight who way down in their hearts believe that great bodies of the American people really want to destroy their business and confiscate their property; that they are enemies to the men who are carrying on the vast business essential to our prosperity.

Very properly Senator Root added that neither of the views to which he had alluded was true; but that misunderstandings had come about which are hindering the solution of industrial and economic problems. He urged education and the spread of right ideas on questions now uppermost.

Plainly, readiness to receive legislative proposals for remedying any inequalities or injustices which exist in the industrial order is the chief characteristic of the present popular mood. Employers who have formed associations to bring their united influence to bear upon public opinion on labor questions and all industrial issues are to-day facing the probability of more enactments directly inspired by organized labor than at any other time in the history of their movement. It was directly charged in the late campaign that manufacturers have thrived at the expense of the great body of the American people, and that a change must be made which presumably will confer certain benefits upon the consuming multitudes at the expense of the manufacturers. The high cost of living has been linked up with the tariff in popular thinking, and the new administration comes into power definitely committed to a reduction in the tariff and thus, by inference, to a reduction in prices of much that enters into cost of living. There is such widespread faith in the power of legislation to cure the causes of existing discontent that expectation of what will be enacted at Washington in the coming year is at a high pitch. That under such conditions ill-advised measures stand a good chance of getting on the statute books need scarcely be said. Unfortunately, at such a time diversity of interests rather than common interests will be emphasized and laws are likely to be made with too little thought that the injury of one part of the community is the concern of every other part.

At employers' association meetings, as at that of the National Founders' Association last week emphasis is constantly put upon the need of larger publicity for the manufacturers' view of economic and labor questions, on the ground that much popular misunderstanding exists. No doubt a great deal is yet to be done in that direction. But in the present temper of large numbers of the American people the so-called educational process is much too slow-paced to be of use in staying the flood of legislation that has been accumulating. The history of periods of prosperity is that agitation for a new basis for dividing the joint product of capital and labor is then most insistent and class interests and oppositions are most sharply brought out. The next depression, whenever it comes, is far more likely to bring the better appreciation of mutual interest than any propaganda that might be undertaken in a situation like to-day's. It is safe to prophesy that the legislative programme that is ahead will fail to reduce the cost of living without an accompanying reduction of incomes. When that failure is fully demonstrated, there may be more room for the old-fashioned belief that the interests of manufacturers and their employees and of producers and consumers are bound up together. About the same time the discovery will be made again that the notion that one of these classes can really be benefited by hurting the other is a snare and a delusion.

The Bell Pension and Insurance System

The American Telephone & Telegraph Company announces that it will maintain a fund of $10,000,000 from which pensions, sick and accident benefits and life insurance will be provided for its 175,000 employees. The plan is the latest development of a form of paternalism that exists in many lines of business in a more or less organized manner and that is going forward rapidly. A comparatively few years ago the pensioning of employees was rare and was carried out in a rather desultory way. No system existed under which

a workman could feel sure of this protection in his old age, as a return for continuous, faithful service. Meantime workmen's compensation under governmental regulation has come into vogue, and the suddenness of its coming is remarkable. Ten years ago few would have believed there was a remote chance that such a radical change in employer's liability would be effected in this generation. Now the new order is established in many States of the Union and will soon be of national extent, constituting accident insurance for all employees during their work.

The Bell telephone plan goes farther than most of those to which public attention has been called, for it extends to life insurance that provides benefits where death results from sickness or injuries incurred outside of employment. After a certain period of service an employee may retire on a pension. The accident disability clause is more liberal than those of the State workmen's compensation laws. The injured employee will receive for total disability full pay for 13 weeks and half pay for the remainder of his disability, up to six years, and for temporary disability full pay for 13 weeks and half pay until able to earn a livelihood, not exceeding six years. This clause may come in conflict with the laws of certain States, including Massachusetts, which prohibit the substitution of a private compensation system for that provided by statute.

Under the Bell telephone plan employees who have served a certain period of years will receive a generous percentage of their wages when they are disabled by sickness or accident outside of the regular course of business. The amount due them under such conditions varies with the length of service, the minimum period being two years, though heads of departments may at their discretion grant the continuance of wages to others whose terms of employment are shorter.

The most radical feature of the plan is that of life insurance. In case of death resulting from accident suffered in the performance of work for the company, the dependents of the workmen will receive an amount equivalent to three years' pay, up to a maximum of $5,000. In case of death resulting from sickness or accident outside of the business, the indemnity will be one year's pay where the employee has been 10 years in the service, and one-half of one year's pay where the service has been from 5 to 10 years, the maximum payment being $2,000.

The problems of pensions and insurance for industrial workers have been dealt with in familiar ways by various foreign countries. The laws in Germany, Great Britain and elsewhere in operation are being studied by American economists in the belief that before many years we shall follow along similar lines, with the purpose of insuring the maintenance of old or disabled workers under conditions contributing to self-respect. The private systems are paving the way, and the plan of the American Telephone & Telegraph Company is of interest as a gauge of the progress already made.

The United Steel Company, Canton, Ohio, is completing the installation of 12 new gas producers, which will make a total of 24. These producers will be used when the supply of natural gas is not available, as the natural gas company reserves the privilege of cutting off manufacturing plants in very cold weather, conserving the gas for domestic consumers. The company will therefore use producer gas when necessary and natural gas when it can be had. The 12 new gas producers were built by the S. R. Smythe Company, Pittsburgh, while the Kittoe Boiler & Tank Company, Canton, Ohio, built the flues and shells.

Western Coke Freight Rates Attacked

WASHINGTON, D. C., November 26.—Argument was concluded yesterday before the Interstate Commerce Commission in the case of the Youngstown Sheet & Tube Company and 16 other iron and steel companies in the Youngstown district against the Pittsburgh & Lake Erie Railroad and others; in the case of the Wisconsin Steel Company against the same railroad and others; and in the case of the Coke Producers' Association of the Connellsville region against the Baltimore & Ohio Railroad and others, all three cases, attacking the rates on coke, being consolidated for the purpose of argument. Voluminous testimony has been taken and the whole subject now awaits the action of the commission.

The Youngstown companies challenge the rate of $1.35 per ton of 2000 lb. on coke from the Connellsville district to the Youngstown district as excessive and discriminatory, and a materially lower rate is asked. On behalf of these companies Richard Jones and James Kennedy of Youngstown and William Rand, Jr., of New York, attorneys, urged that the coke rate in question has steadily advanced co-incidentally with a vast increase in the density of the traffic; that the rate challenged is grossly disproportionate to the cost of the service; the rate complained of discriminates against the Valleys district; that coke to the Youngstown district is discriminated against as a commodity in that it is made to pay an undue proportion of the carriers' gross revenue when compared with other commodities, and that the rate will not bear comparison with the rates charged for similar and for longer coke hauls in other territories. It was also urged that the carriers can well afford a reduction of the rate to a reasonable figure. Statistics were filed showing the prosperous condition of the chief carriers.

The complaining companies in this case are the Youngstown Sheet & Tube Company, Republic Iron & Steel Company, Deforest Sheet & Tin Plate Company, Sharon Steel Hoop Company, Valley Mold & Iron Company, Sharpsville Furnace Company, Girard Iron Company, Brier Hill Iron & Coal Company, Youngstown Steel Company, Struthers Furnace Company, Ohio Iron & Steel Company, Andrews & Hitchcock Iron Company, Empire Iron & Steel Company, Thomas Steel Company, Shenango Furnace Company, Youngstown Iron & Steel Company and Stewart Iron Company, Ltd.

In the case of the Wisconsin Steel Company and the Inland Steel Company against the carriers named, the present rate of $2.50 per ton from the Connellsville district to the Chicago district is attacked as excessive and discriminatory, and the argument was along the same lines as in the Youngstown case. Francis B. James and E. E. Williamson of Washington represented the two companies named.

The Coke Producers' Association attacks rates on coke to numerous points and asks for a general reduction on the ground that they are out of all proportion to the cost of the service, and it was charged today by Wade H. Ellis, representing the producers, that the evidence showed that by agreement among the railroads the Connellsville region has been discriminated against in its coke rates in practically every instance in favor of other competing districts.

Attorneys representing the carriers denied that the rates in all three cases were unreasonable, and placed in the records numerous exhibits and statistics which they claimed justified the present rates. W. L. C.

The Swenson Valve Company, Decorah, Iowa, has received an order for all the globe and angle valves for the lubricating system which is to be installed in connection with the large hydroelectric development at Keokuk. The initial shipment calls for 165 valves ranging in size from ¼ to 2 in., and the entire number required for this work is said to be the greatest of any single lubricating system in the United States.

The Strong, Carlisle & Hammond Company, Cleveland, Ohio, has moved its Boston branch store room from 180 High street to 200 Congress street. It will carry a line of gas and oil furnaces, steam specialties, set screws and extension bolts. R. L. Woodward has been promoted to the managership of this branch.

The Steel Corporation Dissolution Suit

WASHINGTON, D. C., November 26.—The attorneys representing the Department of Justice and those representing the United States Steel Corporation will before December 15 agree upon a date for the continuation of the taking of testimony before Examiner J. A. Brown of the United States Court at Philadelphia, in the suit instituted by the Government for the dissolution of the Steel Corporation. The next hearing will take place in New York City.

To place in the record testimony of a statistical nature, the examiner held hearings in this city beginning last week, Francis Walker, assistant commissioner of the Bureau of Corporations, being the first witness. The attorneys for the Steel Corporation objected to what they termed "argument" by Mr. Walker in connection with the presentation of statistics gathered by the bureau, and they gave notice that they would halt the examination until the court at Philadelphia could rule on the matter. It developed that the court would not be in session until December 2, and therefore the hearing continued until that date, or following, when the attorneys representing the corporation gave notice that they would move to have stricken from the record a large part of Mr. Walker's testimony on the ground that it was argumentative, hearsay, etc.

When the hearing was resumed, Mr. Walker continued on the stand explaining his tables, and numerous objections by the corporation's attorneys were made, which will be considered by the court as to its admissibility on December 2, or thereafter.

Commissioner of Corporations Luther Conant testified as to the organization of the Steel Corporation and as to other matters affecting the iron and steel trade. He was placed on the stand primarily to place in evidence the report of the bureau on the Steel Corporation and to reiterate the conclusions of the bureau in its report that the corporation was overcapitalized to the extent of $600,000,000.

J. P. Muller, a chartered accountant, was placed on the stand by the Government to testify as to freight rates and as to the ownership by the Steel Corporation of ore carrying roads. Among other things, Mr. Muller said that his computations showed that the cost of carrying ore from the mines in the Northwest to Pittsburgh was approximately 53 cents a ton, but that the published freight rate at the time of the institution of the present proceeding was 96 cents a ton, and that the independents labored under a disadvantage in this regard, as the Steel Corporation owned or controlled ore carrying roads. W. L. C.

W. B. Dickson Heads Pump Company

William B. Dickson, who resigned in the spring of 1911 as first vice-president of the United States Steel Corporation, and has not been active in business since that time, has been elected president of the International Steam Pump Company. He succeeds the late Benjamin Guggenheim. Mr. Dickson took employment with the Carnegie Steel Company at the Homestead works in 1881. After successive promotions he became assistant to President C. M. Schwab and a Carnegie partner. He was assistant to Mr. Schwab when the latter was president of the Steel Corporation; later he became second vice-president, and on the resignation of James Gayley, early in 1909, was elected first vice-president.

The National Gas Engine Association has issued a provisional programme for the annual convention to be held at Claypool Hotel, Indianapolis, Ind., December 3 to 5. Among the papers to be presented are the following: "Gas Engine Design," by Prof. C. D. Wagner, Rose Polytechnic Institute; "Castings," by Crispin Oglebay, Ferro Foundry & Machine Company; "Gas Engines for Industrial Purposes," by Charles Kratsch, Colborne Mfg. Company; "Relations Between the Technical Schools and the Manufacturer," by Prof. George W. Munro, Purdue University; "Gas Engine Economy," by A. E. Potter.

The H. W. Johns-Manville Company, New York City, has issued a pamphlet illustrating its various types of fire extinguishers and chemical fire engines.

Massachusetts Savings Bank Life Insurance

On October 31, 1912, the fourth financial year of Massachusetts savings bank life insurance was completed, with 6665 policies in force representing insurance to the amount of $2,531,409. The four savings insurance banks show a total premium income of $101,632.27 for the year, which is an increase of 33.1 per cent. over the preceding year. There are now 175 agencies in manufacturing establishments of Massachusetts. Among new agencies recently established are the Atlantic Works, East Boston; Revere Rubber Company, Chelsea; Frank Mossberg Company, Attleboro; Samson Cordage Works, Shirley; Isaac Prouty & Co., Inc., Spencer; National Blank Book Company, Holyoke; James Hunter Machine Company, North Adams, and Arnold Print Works, North Adams. The plan renders it possible for wage-earning men and women to make reasonable provision by small monthly payments out of current earnings against the contingencies of the future.

Iron and Steel Production in Sweden

The production of iron ore in Sweden in 1911 was 6,153,778 metric tons, of which 5,769,528 tons was directly usable ore, 3,060 tons bog ore and 381,190 tons concentrates. The concentrates resulted from the treatment of 813,973 tons of low-grade ore. Pig iron production was 634,392 tons from 112 furnaces, against 603,939 tons in 1910. Foundry and special pig iron amounted to 32,992 tons, Bessemer and basic to 408,591 tons, forge to 181,525 tons and blast furnace castings to 11,284 tons. One electric ore reducing furnace produced 10,065 tons. The output of puddled iron blooms and bars was 146,722 tons, and of steel ingots and castings, 470,867 tons. The total of crucible and electric furnace ingots was 4,195 tons. The total of manufactured iron and steel was 456,355 tons, against 465,062 tons in 1910.

The Rail Committee of the American Railway Engineering Association is utilizing the giant 800,000-lb. Riehle machine in the Fritz Engineering Laboratory at Lehigh University, South Bethlehem, Pa., for important tests of rails. Conducted as a part of the research work undertaken jointly by railroads and steel manufacturers, these tests are expected to aid materially in the effort to reduce the number of rails that are found defective each year. M. H. Wickhorst, of Chicago, engineer of tests of the Rail Committee, is in charge of the work. In the tests at South Bethlehem he is being assisted by members of the civil engineering department of Lehigh University. The present phase of the research is investigating the rate of reduction of the cross-section in rolling from the ingot to the finished rail. One hundred pieces of 100-lb. American Railway Association section, two ft. long, are being used.

The Baldwin Locomotive Works, which has used four Saurer motor trucks for four years, has placed an order for six more. The service in which these motor cars are used is most exacting. They not only haul raw material between the shops but are often compelled to carry large overloads in the form of logging and industrial locomotives to the terminals and wharves of Philadelphia. The original installation of four trucks displaced 20 double teams, and it is stated that from close records kept the company saved more than 33 1/3 per cent. over its horse equipment. The Saurer truck is built by the International Motor Company, whose general offices are at Broadway and Fifty-seventh street, New York.

The National Iron & Steel Company, dealer in rails and railroad equipment and supplies, Houston, Texas, expects to establish an office at an early date at St. Louis, Mo., with its vice-president, I. H. Cohn, in charge. This company has just purchased about 3500 tons of relaying and rerolling rails from the Toledo, St. Louis & Western Railroad, and will ship the relaying rails, which are of 70-lb. section, to the West and Southwest.

The Lackawanna Steel Company has recently put in operation at its plant at Lackawanna, N. Y., the new 600-ton mixer which has been built adjoining its open-hearth furnaces.

The Iron and Metal Markets

Eastern Buying of Lake Ores

Foreign Supply Curtailed by European Activity

A Change in Pipe Weights and Lists—Pig Iron Markets Generally Quiet

Activity in finished iron and steel shows no abatement, though the volume is less in contracts for distant deliveries and more in orders for early shipment. With prices on present profitable levels and with mills sold six to eight months ahead in some lines, buyers are not rushing into the market, either to escape higher prices later or to make sure of getting material they will need months hence. Such assurance, as present experience shows, does not always produce the steel when wanted.

Complaints of inability to get finished steel in anything like the contract time or quantities are many and loud, and some mill methods of prorating shipments are provoking sharp criticism, particularly from buyers whose contracts were taken early in the year. Warehouse stocks are being more heavily drawn upon and as only a part of the outgo can be replenished this source of supply is not as sure as it was.

The significant feature of the Lake Superior iron ore market is that more than 1,000,000 tons of non-Bessemer ores have been sold to Eastern furnaces which bought little or no Lake ore this year. The heavy European demand has left little foreign ore available for this country and high ocean freights have also worked to put up prices; but the certainty of getting Lake ores is a chief incentive. Some sales of Eastern ores have been made at prices about 50 cents above this year's, while on one ore of which sales were made earlier, little advance was realized. The available Newfoundland ore for 1913 has practically all been sold.

Not all Central Western furnace companies are covering for their 1913 ore. It will be 18 months before the last of the ore bought this month will be charged into furnaces, and that is a long look ahead. Buyers who wait until spring will shorten the period of risk by six months. Some consumers of non-Bessemer ores consider the advance excessive, but sellers point to the fact that the premiums charged heretofore on iron content above 53 per cent. are not now asked.

The lull in foundry pig iron continues, Buffalo alone reporting any considerable sales for the week. Of the total of 40,000 tons, half went to Canadian buyers, 10,000 tons of basic and 10,000 tons of malleable. One Southern company sold 5000 tons for export to Mediterranean points on the basis of $14.62 at Birmingham for No. 2 and has now advanced its domestic price to $14.50 as minimum. Some Southern iron in dealers' hands is still sold below the $14 basis. At Buffalo one important furnace interest has withdrawn from the market on shipments before July 1.

In the Central West basic iron is still held at $16.50 at Valley furnace and Bessemer iron at $17.25. Sales of 8000 to 10,000 tons of Bessemer and of 5000 to 6000 tons of basic iron are reported. Eastern Pennsylvania furnaces have sold 5000 tons of basic iron to a steel company in that district, the delivered price being about $18.15.

Semi-finished steel in the Pittsburgh district is higher. A large company, inquiring for 5000 to 10,000 tons of open hearth sheet bars, was quoted close to $30 at Pittsburgh. Complaints of shortage are less numerous, but the fact that contracts for the first quarter of 1913 are still in abeyance is causing uneasiness to some sheet and tin plate mills.

An additional 50,000 tons of rails placed by the Pennsylvania Railroad this week brings its total up to about 200,000 tons. The Lehigh Valley has bought upward of 40,000 tons, distributed among three or four mills. The Reading has divided 25,000 tons between the Bethlehem and Pennsylvania Steel companies. Of the Rock Island order for 40,000 tons 34,000 tons went to the Illinois Steel Company and 1500 tons each to four other companies.

The large car inquiries recently reported are still pending. For the ore and other roads of the Steel Corporation 3000 new cars will be bought. The New York Central's large programme of car buying may go over until next year, it is now said. Car works operations are curtailed by a shortage of plates, and two important plate mills are reported sold up for practically all of next year.

On Wednesday, November 27, the National Tube Company notified the trade of its intention to change pipe weights and lists generally on January 1, 1913. This action is taken, the company states, to improve quality but not to raise prices.

Ferromanganese prices continue to advance, British producers now asking $63.50 to $65 Baltimore for the first half of next year. The leading buyer of ferrosilicon at Pittsburgh has closed for 8000 tons and has bought 1500 tons of ferrochrome.

At Pittsburgh the strike of trainmen in the employ of the Carnegie Steel Company has caused but little reduction of output thus far, and an adjustment of the demands for an advance is expected.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type. Declines in Italics.

At date, one week, one month and one year previous.

	Nov. 27, 1912.	Nov. 20, 1912.	Oct. 30, 1912.	Nov. 29, 1911.
Pig Iron, Per Gross Ton:				
Foundry No. 2 X, Philadelphia	**$18.50**	$18.25	$18.00	$14.85
Foundry No. 2, Valley furnace	17.00	17.00	16.25	13.00
Foundry No. 2 S'th'n, Cin'ti	17.25	17.25	17.25	13.00
Foundry No. 2, Birmingham, Ala.	14.00	14.00	14.00	9.75
Foundry No. 2, furnace, Chicago*	18.00	18.00	17.50	14.00
Basic, delivered, eastern Pa.	18.25	18.25	18.00	14.50
Basic, Valley furnace	16.50	16.50	16.25	12.25
Bessemer, Pittsburgh	18.15	18.15	17.90	14.90
Malleable Bessemer, Chicago	18.00	18.00	17.50	14.35
Gray forge, Pittsburgh	**17.15**	16.75	16.40	13.25
Lake Superior charcoal, Chicago	18.75	18.75	18.25	16.50
Billets, etc., Per Gross Ton:				
Bessemer billets, Pittsburgh	27.00	27.00	27.00	19.00
Open hearth billets, Pittsburgh	27.00	27.50	27.50	18.50
Forging billets, Pittsburgh	34.00	34.00	34.00	24.00
Open hearth billets, Philadelphia	32.00	32.00	30.00	21.40
Wire rods, Pittsburgh	30.00	30.00	29.00	25.00
Old Material, Per Gross Ton:				
Iron rails, Chicago	18.00	18.00	18.00	14.50
Iron rails, Philadelphia	19.00	19.00	18.00	15.50
Car wheels, Chicago	17.00	17.00	16.50	12.50
Car wheels, Philadelphia	15.00	15.00	15.00	11.50
Heavy steel scrap, Pittsburgh	*14.75*	15.00	16.25	12.00
Heavy steel scrap, Chicago	*13.00*	13.50	13.75	9.50
Heavy steel scrap, Philadelphia	15.50	15.50	15.50	11.50

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Finished Iron and Steel,	Nov. 27, 1912.	Nov. 20, 1912.	Oct. 30, 1912.	Nov. 29, 1911.
Per Pound to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Bessemer rails, heavy, at mill..	1.25	1.25	1.25	1.25
Iron bars, Philadelphia.....	1.67½	1.67½	1.65	1.20
Iron bars, Pittsburgh.....	1.65	1.65	1.55	1.20
Iron bars, Chicago	1.55	1.55	1.50	1.15
Steel bars, Pittsburgh, future..	1.40	1.40	1.40	1.05
Steel bars, Pittsburgh, prompt..	1.60	1.60	1.40	1.05
Steel bars, New York, future..	1.56	1.56	1.56	1.21
Steel bars, New York, prompt..	1.76	1.76	1.56	1.21
Tank plates, Pittsburgh, future.	1.45	1.45	1.45	1.10
Tank plates, Pittsburgh, prompt	**1.70**	1.60	1.60	1.10
Tank plates, New York, future..	1.61	1.61	1.61	1.26
Tank plates, New York, prompt	**1.86**	1.76	1.76	1.26
Beams, Pittsburgh, future.....	1.45	1.45	1.45	1.10
Beams, Pittsburgh, prompt.....	**1.75**	1.70	1.45	1.10
Beams, New York, future.....	1.61	1.61	1.61	1.26
Beams, New York, prompt.....	**1.91**	1.86	1.61	1.26
Angles, Pittsburgh, future.....	1.45	1.45	1.45	1.10
Angles, Pittsburgh, prompt.....	**1.75**	1.70	1.45	1.10
Angles, New York, future.....	1.61	1.61	1.61	1.26
Angles, New York, prompt.....	**1.91**	1.86	1.61	1.26
Skelp, grooved steel, Pittsburgh	1.45	1.45	1.40	1.12½
Skelp, sheared steel, Pittsburgh	1.50	1.50	1.45	1.20
Steel hoops, Pittsburgh.....	1.50	1.50	1.50	1.30
Sheets, Nails and Wire,				
Per Pound to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	2.25	2.25	2.25	1.85
Wire nails, Pittsburgh.....	1.70	1.70	1.70	1.50
Cut nails, f.o.b. Eastern mills..	1.75	1.75	1.70	...
Cut nails, Pittsburgh	1.70	1.70	1.75	1.45
Fence wire, ann'l'd, 0 to 9, P'gh.	1.50	1.50	1.50	1.30
Barb wire, galv., Pittsburgh....	2.10	2.10	2.10	1.85
Coke, Connellsville,				
Per Net Ton at Oven:				
Furnace coke, prompt shipment.	**$3.90**	$3.85	$4.00	$1.50
Furnace coke, future delivery..	**3.25**	3.00	3.00	1.60
Foundry coke, prompt shipment	4.25	4.25	4.25	1.85
Foundry coke, future delivery..	3.75	3.75	3.75	2.10
Metals,				
Per Pound to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York.....	17.75	17.75	17.75	13.25
Electrolytic copper, New York..	17.62½	17.62½	17.37½	13.12½
Spelter, St. Louis.....	7.35	7.35	7.35	6.80
Spelter, New York.....	7.50	7.50	7.50	6.95
Lead, St. Louis.....	4.35	4.50	4.85	4.35
Lead, New York.....	4.50	4.65	5.00	4.45
Tin, New York.....	49.55	49.65	50.00	45.25
Antimony, Hallett, New York..	9.75	9.75	9.75	7.60
Tin plate, 100-lb. box, Pittsburgh	$3.60	$3.60	$3.60	$3.40

Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.; New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Louis, 22½c.; Kansas City, 42½c.; Omaha, 42½c.; St. Paul, 32c.; Denver, 84½c.; New Orleans, 30c.; Birmingham, Ala., 45c.; Pacific coast, 80c. on plates, structural shapes and sheets No. 11 and heavier; 85c. on sheets Nos. 12 to 16; 95c. on sheets No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.45c. to 1.70c., base, net cash, 30 days. Following are stipulations prescribed by manufacturers, with extras:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ½ in. and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per sq. ft., are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge, or not less than 11 lb. per sq. ft., to take base price. Plates over 72 in. wide ordered less than 11 lb. per sq. ft., down to the weight of 3-16 in., take the price of 3-16 in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Extras.	Cents per lb.
Gauges under ¼ in. to and including 3-16 in.....	.10
Gauges under 3-16 in. to and including No. 8.....	.15
Gauges under No. 8 to and including No. 9.....	.25
Gauges under No. 9 to and including No. 10.....	.30
Gauges under No. 10 to and including No. 12.....	.40
Sketches (including straight taper plates) 3 ft. and over	.10
Complete circles, 3 ft. in diameter and over.....	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel.....	.20
Still bottom steel	.30
Marine steel	.40
Locomotive fire box steel.....	.50
Widths over 100 in. up to 110 in., inclusive.....	.05
Widths over 110 in. up to 115 in., inclusive.....	.10
Widths over 115 in. up to 120 in., inclusive.....	.15
Widths over 120 in. up to 125 in., inclusive.....	.25
Widths over 125 in. up to 130 in., inclusive.....	.50
Widths over 130 in.....	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inc.	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inc.	.50
Cutting to lengths or diameters under 1 ft.....	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

Structural Material.—I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in., on one or both legs, ¼ in. and over, and zees, 3 in. and over, 1.45c. to 1.70c. Other shapes and sizes are quoted as follows:

	Cents per lb.
I-beams over 15 in.....	1.50 to 1.55
H-Beams over 18 in.....	1.50 to 1.55
Angles over 6 in.....	1.50 to 1.55
Angles, 3 in. on one or both legs, less than ¼ in. thick, plus full extras, as per steel bar card, Sept. 1, 1909.....	1.50 to 1.55
Tees, 3 in. and up.....	1.50 to 1.55
Angles, channels and tees, under 3 in. plus full extras as per steel bar card, Sept. 1, 1909..	1.50 to 1.55
Deck beams and bulb angles.....	1.75 to 1.80
Hand rail tees	2.20 to 2.30
Checkered, trough and corrugated floor plates...	2.35 to 2.55

Extras for Cutting to Length.

	Cents per lb.
Under 3 ft., to 2 ft. inclusive.....	.25
Under 2 ft., to 1 ft. inclusive.....	.50
Under 1 ft.....	1.55

No charge for cutting to lengths 3 ft. and over.

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on steel pipe (card weight) in effect from September 10, 1912, one point greater being allowed on merchant weight; iron pipe (full weight), from October 21, 1912:

Butt Weld.

Steel. Inches.	Black.	Galv.	Iron. Inches.	Black.	Galv.
⅛, ¼ and ⅜.....	72	52	⅛ and ¼.....	67	48
½	76	66	⅜	66	47
¾ to 3.....	79	71	½	70	57
			¾ to 2½.....	73	62

Lap Weld.

2	76	68	1¼	57	46
2½ to 6.....	78	70	1½	68	57
7 to 12.....	76	66	2	69	59
13 to 15.....	53	..	2½ to 4.....	71	62
			4½ to 6.....	71	62
			7 to 12.....	69	56

Plugged and Reamed.

1 to 3, butt.....	77	69	1 to 1½, butt.....	71	60
2, lap	74	66	2, butt	72	61
2½ to 4, lap.....	76	68	1½, lap	55	44
			1½, lap	66	55
			2, lap	67	57
			2½ to 4, lap.....	69	60

Butt Weld, extra strong, plain ends.

⅛, ¼ and ⅜.....	68	58	⅜	64	53
½	73	67	½	68	61
¾ to 1½.....	77	71	¾ to 1½.....	72	63
2 to 3.....	78	72	2 and 2½.....	73	64

Lap Weld, extra strong, plain ends.

2	74	66	1½	66	60
2½ to 4.....	76	68	2	67	59
4½ to 6.....	75	67	2½ to 4.....	71	62
7 to 8.....	68	58	4½ to 6.....	70	61
9 to 12.....	63	53	7 and 8.....	64	54
			9 to 12.....	59	48

Butt Weld, double extra strong, plain ends.

½	63	57	½	58	50
¾ to 1½.....	66	60	¾ to 1½.....	61	53
2 to 2½.....	68	62	2 to 2½.....	63	55

Lap Weld, double extra strong, plain ends.

2	64	58	2	56	50
2½ to 4.....	66	60	2½ to 4.....	61	55
4½ to 6.....	65	59	4½ to 6.....	60	54
7 to 8.....	58	48	7 to 8.....	53	43

The above discounts are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are two (2) points lower basing (higher price) than the above discounts on black and three (3) points on galvanized.

Wire Rods and Wire.—Bessemer, open hearth and chain rods, $30. Fence wire, Nos. 0 to 9, per 100 lb., terms 60 days or 2 per cent. discount in 10 days, carload lots to jobbers, annealed, $1.50; galvanized, $1.90. Galvanized barb wire, to jobbers, $2.10; painted, $1.70. Wire nails to jobbers, $1.70.

The following table gives the price to retail merchants on fence wire in less than carloads, with the extras added to the base price:

Plain Wire, per 100 lb.

Nos.	0 to 9	10	11	12 & 12½	13	14	15	16
Annealed	$1.65	$1.70	$1.75	$1.80	$1.90	$2.00	$2.10	$2.20
Galvanized	2.05	2.10	2.15	2.20	2.30	2.40	2.80	2.90

Boiler Tubes.—Discounts on lap welded steel and standard charcoal iron boiler tubes to jobbers in carloads are as follows:

Steel.		*Standard Charcoal Iron.*	
1¾ to 2¼ in.....	62	1¼ in.	46
2½ in.	64½	1¾ to 2¼ in.....	48
2¾ to 3¼ in.....	69½	2½ in.	53
3½ to 4 in.....	72	2¾ to 3¼ in.....	55½
5 and 6 in.....	64½	3½ to 5 in.....	58
7 to 13 in.....	62		

Locomotive and steamship special grades bring higher prices.

2½ in. and smaller, over 18 ft., 10 per cent. net extra.
2¾ in. and larger, over 22 ft., 10 per cent. net extra.

Less than carloads will be sold at the delivered discounts for carloads, lowered by two points for lengths 22 ft. and under to destinations east of the Mississippi River; lengths over 22 ft. and all shipments going west of the Mississippi River must be sold f.o.b. mill at Pittsburgh basing discount, lowered by two points.

Sheets.—Makers' prices for mill shipments on sheets of U. S. Standard gauge, in carload and larger lots, on which jobbers charge the usual advance for small lots from store, are as follows, f.o.b. Pittsburgh, terms 30 days net or 2 per cent. cash discount in 10 days from date of invoice:

Blue Annealed Sheets.

	Cents per lb.
Nos. 3 to 8	1.60 to 1.70
Nos. 9 and 10	1.65 to 1.75
Nos. 11 and 12	1.70 to 1.80
Nos. 13 and 14	1.75 to 1.85
Nos. 15 and 16	1.80 to 1.90

Box Annealed Sheets, Cold Rolled.

Nos. 10 and 11	1.90 to 2.00
No. 12	1.90 to 2.00
Nos. 13 and 14	1.95 to 2.05
Nos. 15 and 16	2.00 to 2.10
Nos. 17 to 21	2.05 to 2.15
Nos. 22 and 24	2.10 to 2.20
Nos. 25 and 26	2.15 to 2.25
No. 27	2.20 to 2.30
No. 28	2.25 to 2.35
No. 29	2.30 to 2.40
No. 30	2.40 to 2.50

Galvanized Sheets of Black Sheet Gauge.

Nos. 10 and 11	2.40 to 2.50
No. 12	2.50 to 2.60
Nos. 13 and 14	2.50 to 2.60
Nos. 15 and 16	2.65 to 2.75
Nos. 17 to 21	2.80 to 2.90
Nos. 22 and 24	2.95 to 3.05
Nos. 25 and 26	3.10 to 3.20
No. 27	3.25 to 3.35
No. 28	3.40 to 3.50
No. 29	3.55 to 3.65
No. 30	3.70 to 3.80

Pittsburgh

PITTSBURGH, PA., November 27, 1912.

The pressure on the mills for deliveries is as tense as at any time in the past, but the new demand for finished iron and steel has diminished to some extent, as consumers are now well covered over the remainder of this year and into first and second quarters of next year. The large steel companies have absolutely nothing to spare for this year and very little for first quarter while they have heavy contracts booked for second and third quarters of 1913. One interest is understood to be selling steel bars heavily at 1.40c. and plates and shapes at 1.45c. for delivery through all next year and has entered an enormous tonnage. If all the material represented in these contracts is taken, the mills of this company are pretty sure to run to capacity all of next year. This condition prevails in perhaps a modified degree among other steel makers in this district, and hence the outlook for next year as regards contracts entered could not be better. It will certainly take something much out of the ordinary to disturb seriously the present active conditions, which to all appearances seem assured to July 1 at least. Specifications against contracts are particularly heavy in plates, shapes, sheets and tubular goods. The consumption of plates is beyond all precedent, and several of the car companies are not able to turn out their full quota of cars on account of slow plate deliveries by the mills. The recent heavy purchases of Bessemer and basic iron have put the pig iron market on a very firm basis, and a leading maker expresses the opinion that by January 1 Bessemer iron will be selling close to $18 and basic $17, Valley furnace. The supply of semi-finished steel seems to be slightly better and complaints from consumers about shortage are less numerous. The coke trade is fairly active, prompt furnace selling at $4 and some makers quote on contracts at $3.50 per net ton at oven. The weak spot in the situation is scrap, the supply just now seeming to be larger than the demand, with the result that prices have shown a further decline.

Pig Iron.—Following the recent heavy sales, the local market is less active but remains very strong. A leading steel company, a recent heavy purchaser, is still picking up odd lots of Bessemer and basic at about $17.25 for Bessemer and $16.25 to $16.50 for basic. No large lots of Bessemer can be had at less than $17.25 and of basic at less than $16.50, Valley furnace. A local consumer sent out an inquiry last week for 3000 tons of Bessemer for January, February and March, on which the lowest quotation received was $17.25 and the highest $17.85, Valley furnace. We note sales of 8000 to 10,000 tons of Bessemer at $17.25 and 5000 to 6000 tons of basic at about $16.50. Sales are also reported of 1200 tons of No. 2 foundry of special grade for January, February and March at $17.50, Valley furnace, and 6000 to 8000 tons of malleable Bessemer for first quarter at $17.25 to $17.50. We quote standard Bessemer iron at $17.25 for remainder of this year and first quarter; basic, $16.50 for same deliveries; No. 2 foundry, $17 for prompt and $17 to $17.25 for first quarter; gray forge, $16.25 to $16.50; malleable Bessemer, $17 to $17.25, all at Valley furnace, the freight rate for delivery in the Pittsburgh district being 90c. a ton.

Billets and Sheet Bars.—Most of the available steel on the open market is now held by dealers who have secured it in trades for pig iron and other material, and are selling it at top prices. A sale of 600 tons of open-hearth sheet bars for December and January delivery is thus reported to have been made at about $28.50, Pittsburgh. A leading consumer has been scouring the market for several weeks for 5000 to 10,000 tons of sheet bars, and so far the lowest price quoted was by an Eastern mill at close to $30 delivered, Pittsburgh. For shipment at convenience of the mill we quote: Bessemer billets, $27; Bessemer sheet bars, $27.50; open-hearth billets, $27.50, and open-hearth sheet bars, $28, f.o.b. mill, Pittsburgh or Youngstown. Forging billets are $34 or higher and axle billets are about $32 to $33, Pittsburgh.

Ferroalloys.—The item of interest in this market is that the leading consumer has covered for about 8000 tons of 50 per cent. ferrosilicon and about 1500 tons of ferrochrome, all for 1913 delivery. The order for the ferrosilicon was placed with the Electro-Metallurgical Company, New York City. The new inquiry for ferromanganese is quiet, most consumers being covered by contracts; on these, however, deliveries are not satisfactory. It is predicted that if the Balkan war continues into next year prices on both English and German ferromanganese will be much higher. As nearly as can be learned, the price on 80 per cent. English ferromanganese for first half is $63.50 to $65, Baltimore, while for second half $61 is quoted, sellers evidently taking the chance that the market will then be lower. Carload lots of prompt ferromanganese are still bringing $74 to $75, Baltimore. We quote 50 per cent. ferrosilicon, in lots up to 100 tons, at $75; over 100 tons to 600 tons, $74; over 600 tons, $73, Pittsburgh. We quote 10 per cent. at $24; 11 per cent., $25; 12 per cent., $26, f.o.b. cars at furnace, Jackson, Ohio, or Ashland, Ky. We quote ferrotitanium at 8c. per lb. in carloads; 10c. in 2000-lb. lots and over and 12½c. in lots up to 2000 lb.

Steel Rails.—No important orders for standard sections have been taken by the local interest in the past week, which, however, continues to report a very active demand for light rails, having received new orders and specifications in the week for over 4000 tons. The light rail mill of the Carnegie Steel Company at Bessemer is now understood to be pretty well sold up through first quarter. We quote splice bars at 1.50c. per lb. and standard section rails at 1.25c. per lb. Light rails are quoted as follows: 25, 30, 35, 40 and 45-lb. sections, 1.25c.; 16 and 20-lb., 1.30c.; 12 and 14-lb., 1.35c., and 8 and 10-lb., 1.40c., all in carload lots, f.o.b. Pittsburgh.

Wire Rods.—An acute scarcity has developed in the supply of wire rods for the open market, local makers having little to spare after taking care of their own needs. Sales of small lots of both Bessemer and open hearth rods for first quarter have been made at $30, and one sale is reported at a higher price. We continue to quote Bessemer, open hearth and chain rods at $30, Pittsburgh.

Muck Bar.—A sale of 500 tons of standard grade muck bar for December delivery is reported to have been made by a dealer in this city at about $32.50 delivered at buyer's mill. Considerable Eastern muck bar is finding its way into this market on account of the scarcity of domestic. We quote best grades, made from all pig iron, at $32.50, Pittsburgh.

Skelp.—A local consumer, a frequent buyer in the open market, reports that it is almost impossible to get grooved steel skelp at any price and that the other grades are about as scarce. Skelp mills have very heavy contracts on their books running through first quarter and are not able to ship out the material as fast as it is needed. We quote grooved skelp at 1.45c. to 1.50c.; sheared steel skelp, 1.50c. to 1.55c.; grooved iron skelp, 1.75c. to 1.80c.; sheared iron skelp, 1.80c. to 1.85c., delivered at buyers' mills in the Pittsburgh district.

Plates.—No important car orders are reported to have been placed the past week but inquiries are fairly heavy. It is understood that the Pennsylvania and the Baltimore & Ohio will have inquiries out shortly for a large number of steel cars, and other roads are also reported to be making up specifications that will soon be ready for bids. A local car company reports that unsatisfactory deliveries of plates by the mills are cutting

down its output from 20 to 30 cars per day. Mills that are able to make deliveries within two or three weeks from date of contract can readily obtain from 1.70c. to 1.80c. Pittsburgh. We quote ¼-in. and heavier tank plates at 1.45c. to 1.50c., Pittsburgh, for delivery in first and second quarter. The Riter-Conley Mfg. Company has taken a contract for an 800-ton penstock in New York State.

Structural Material.—The order for 2100 tons of steel taken by the Riter-Conley Mfg. Company was for the Solvay Process Company, Detroit, Mich., and not for the New Process Company, Syracuse, N. Y., as stated. The McClintic-Marshall Construction Company has taken 1400 tons for a new machine and erecting shop for the Industrial Works, Bay City, Mich., about 100 tons for an extension to the foundry of the Pittsburgh Valve & Fittings Company, Barberton, Ohio, and about 150 tons for a new steel building for the Superior Steel Company, Carnegie, Pa. As high as 2.10c. has been paid for small lots of beams and channels for prompt delivery. The leading makers are not taking new orders for delivery before second or third quarter of next year. A leading interest is quoting beams and channels up to 15 in. at 1.45c. for delivery at its convenience, which will mean second or third quarter of next year, but it will be impossible to place any new orders for delivery in two or three months at this price. Small lots of beams and channels for quick shipment have sold at 1.75c., and in special cases as high as 2.10c.

Car Wheels.—The demand continues heavy for wheels for both freight and passenger service. We quote 36-in. steel wheels for passenger service at $18.50 and 33-in. for freight service at $14.50 per wheel, f.o.b. Pittsburgh.

Iron and Steel Bars.—Very heavy contracts for steel bars have been placed for delivery into first half of next year on the basis of 1.40c., and in some cases deliveries on these contracts run into third quarter. A leading maker is reported as willing to accept heavy contracts for steel bars for delivery through all of next year at its convenience at the 1.40c. price. Two other makers are said to be refusing to sell beyond second quarter and will only accept a limited tonnage and from favored customers. The demand for iron bars is also heavy. We quote merchant steel bars at 1.40c. to 1.45c. for this delivery, while for shipment this year from 1.50c. to 1.75c. is readily paid by consumers. Prices on iron bars are 1.65c. to 1.70c. at mill for reasonably prompt shipment. Mills continue to charge $1 extra per ton for twisting ¾-in. and larger steel bars and $2 extra for ½ to ⅝ in.

Sheets.—Owing to continued mild weather the demand for roofing, blue annealed and black and galvanized sheets continues heavy. It is evident that all records for output are going to be broken this year. All the mills have taken large contracts for delivery in first quarter and first half of next year. There is a scarcity of sheets for prompt shipment, some mills being able to secure premiums of $2 to $3 a ton if they can promise prompt shipment. In carload and larger lots No. 28 gauge black sheets are firm at 2.25c. and galvanized at 3.40c., jobbers charging the usual advances for small lots from store.

Tin Plate.—New buying for the remainder of this year and first quarter and first half of next is light. Jobbers and consumers have covered their needs for this and next month, while the meat packers and can makers have contracted for their requirements for the first half, and in some cases all through next year. The output of tin and terne plate in 1911 was 783,960 gross tons, but, based on the first ten months, the output this year is expected to considerably exceed 850,000 tons. There is still a shortage in supply of steel and labor. The market is very strong at $3.60 per base box for 14 x 20 coke plates in large lots.

Spelter.—Prices are only fairly steady. Consumers are merely buying what they actually need, believing that prices will be lower. We quote prime grades of Western at 7.30c., East St. Louis, equal to 7.42½c., Pittsburgh.

Railroad Spikes.—Buying by the railroads continues active, one company having contracted for 12,000 to 15,000 kegs for next year and another for about 20,000 kegs. Two of the leading local makers of spikes have their output about sold up for the first half of next year. Small railroad spikes are bringing premiums of $2 to $3 for prompt deliveries. We quote railroad spikes in base sizes, 5½ x 9/16 in., at $1.90 and small railroad and boat spikes at $1.90 and $2 per 100 lb., f.o.b. Pittsburgh, for first quarter and first half of 1913 delivery.

Hoops and Bands.—The new demand is quiet and only for small lots. All the mills are back in deliveries four weeks or longer. We quote steel bands at 1.40c. to 1.45c., with extras as per the steel bar card, and hoops at 1.50c., Pittsburgh, for shipment through first half of next year. For prompt delivery it is probable that premiums would be paid.

Bolts and Rivets.—The market is very firm, with new demand fairly heavy. All the makers are filled up for two months or longer and are considerably back in deliveries. We quote button head structural rivets at $2.10 and cone head boiler rivets at $2.20 per 100 lb. for forward delivery, but for spot shipment a premium of $2 a ton over these prices is obtained. The new discounts on bolts are as follows, in lots of 300 lb. or over, delivered within a 200. freight radius of maker's works:

Coach and lag screws	80 and 10% off
Small carriage bolts, cut threads	75 and 7½% off
Small carriage bolts, rolled threads	75, 10 and 2½% off
Large carriage bolts	70 and 5% off
Small machine bolts, rolled threads	75, 10 and 7½% off
Small machine bolts, cut threads	75, 10 and 2½% off
Large machine bolts	70 and 10% off
Machine bolts with C.P.C. and T nuts, small	75 and 7½% off
Machine bolts with C.P.C. and T nuts, large	70 and 2½% off
Square hot pressed nuts, blanked and tapped	$5.80 off list
Hexagon nuts	$6.40 off list
C.P.C. and R. square nuts, tapped and blank	$5.80 off list
Hexagon nuts ⅝ and larger	$6.70 off list
Hexagon nuts smaller than ⅝	$7.30 off list
C.P. plain square nuts	$5.30 off list
C.P. plain hexagon nuts	$5.60 off list
Semi-finished hexagon nuts ⅝ and larger	85 and 5% off
Semi-finished hexagon nuts smaller than ⅝,	85, 10 and 5% off
Small rivets	80 and 5% off

Wire Products.—The expected advance on wire products has not been made, and it is stated that the head of one of the leading wire companies is opposed to any advance at this time, stating that conditions do not justify it, hence it is possible that prices will stay where they are. As against this several of the leading makers report the demand so heavy that they are back in deliveries from four to six weeks and could readily secure premiums of 5c. to 10c. on wire nails and $1 to $2 a ton on wire if they were in position to make prompt shipment. The continued mild weather is a factor in sustaining the good demand for wire nails and wire fencing. Shortage in cars is interfering with shipments to some extent but has not been so serious as expected. We quote wire nails at $1.70 to $1.75 per keg; cut nails, $1.70 per keg; galvanized barb wire, $2.10 per 100 lb.; painted, $1.70; annealed fence wire, $1.50, and galvanized fence wire, $1.90, f.o.b. Pittsburgh, usual terms, freight added to point of shipment. Jobbers charge the usual advances for small lots from store.

Merchant Steel.—A leading maker reports refusing new orders for delivery before the second quarter. The new demand is active and all the mills are back in shipments from four to six weeks. Prices are strong. We quote: Iron finished tire, 1½ x ⅜ in. and larger, 1.40c. to 1.55c., base; under 1½ x ⅜ in., 1.55c. to 1.65c.; planished tire, 1.60c. to 1.70c.; channel tire, ¾, ⅞ and 1 in., 1.90c. to 2c.; 1⅛ in. and larger, 1.80c. to 1.90c.; toe calk, 2c. to 2.10c., base; flat sleigh shoe, 1.50c. to 1.65c.; concave and convex, 1.80c. to 1.90c.; cutter shoes, tapered or bent, 2.30c. to 2.40c.; spring steel, 2c. to 2.10c.; machinery steel, smooth finish, 1.80c. to 1.85c.

Shafting.—The new demand is only fair, most large consumers being covered by contracts. The implement makers and automobile builders are taking very large quantities, their specifications being heavier than for some time. All makers of shafting have their output pretty well sold through first quarter and have contracts booked for second quarter. Prices are firm. We quote cold-rolled shafting at 60 per cent. off in carload and larger lots and 55 per cent. in small lots, delivered in base territory.

Merchant Pipe.—One of the natural gas companies in California has placed an order for 10 miles of 16-in. steel pipe with a local mill, and the Treat-Crawford natural gas interest is in the market for 15 miles of 10-in. The new demand is slowing down, owing to the lateness of the season, but all the mills have many contracts on their books and the pressure for deliveries is as heavy as ever. Several state that they have little to sell for delivery in first quarter. The output of iron and steel pipe this year will break all records, two local mills stating that up to about November 15 their output was slightly in excess of all of last year. Discounts on both iron and steel pipe, as given on a previous page, are reported as being well maintained.

Boiler Tubes.—Several large contracts for delivery in first quarter and first half of next year have been taken by local mills the past week. The demand for seamless steel and iron tubes for the past six months or more has been enormous, and all the mills have their

output well sold up for the next two or three months. Discounts are reported as being absolutely maintained.

Coke.—The new inquiry for furnace coke for prompt shipment has been better in the past few days. Prices are also firmer. Sales of 6000 to 7000 tons of standard furnace coke have been made for prompt shipment at $4 a ton at oven. No large contracts for furnace coke for next year delivery are reported, but one leading maker states that he has refused $3.25 for a large tonnage for first half delivery, holding it at $3.50. The new demand for foundry coke is active, at high prices, carloads and larger lots selling for prompt shipment at $4.50 to $4.75 per net ton at oven. We quote standard makes of furnace coke for prompt shipment at $3.90 to $4.10 and for first half of next year at $3.25 to $3.50 per net ton at oven. Standard makes of 72-hr. foundry coke for prompt shipment are held at $4.25 to $4.50 and for first half of next year from $3.75 to $4.25 per net ton at oven. Several large makers are holding their furnace coke firm at $3.50 and foundry coke at $4. The Connellsville Courier reports the output of coke last week in the Upper and Lower Connellsville regions as 400,618 net tons, an increase over the previous week of about 700 tons.

Iron and Steel Scrap.—The market continues weak and dull. The chief trouble at present is that there is too much scrap. Consumers are congested with material and are refusing to buy more until some of what they have is used up. On the other hand, some dealers have scrap that has to be moved, and are offering it at relatively low prices. A leading local consumer is taking in a limited amount of selected heavy steel scrap at $15, but sales have been made lower. We note a sale of 300 tons of heavy steel scrap at $14.75 and one of 500 tons of borings for outside delivery at a price equal to about $10.25, Pittsburgh. Dealers quote, per gross ton, as follows:

Heavy steel scrap, Steubenville, Follansbee, Brackenridge, Sharon, Monessen and Pittsburgh delivery	$14.75 to $15.00
No. 1 foundry cast	14.50 to 14.75
No. 2 foundry cast	13.50 to 13.75
Bundled sheet scrap, f.o.b. consumers' mills, Pittsburgh district	12.75 to 13.00
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	16.25 to 16.50
No. 1 railroad malleable stock	14.25 to 14.50
Grate bars	10.75 to 11.00
Low phosphorus melting stock	18.25 to 18.50
Iron car axles	24.25 to 24.75
Steel car axles	17.75 to 18.00
Locomotive axles, steel	21.75 to 22.00
Locomotive axles, iron	27.75 to 28.00
No. 1 busheling scrap	14.25 to 14.50
No. 2 busheling scrap	9.75 to 10.00
Old car wheels	15.75 to 16.00
*Cast iron borings	9.90 to 10.00
*Machine shop turnings	10.50 to 10.75
†Sheet bar crop ends	16.50 to 16.75
Old iron rails	16.25 to 16.50
No. 1 railroad wrought scrap	15.00 to 15.25
Heavy steel axle turnings	12.75 to 13.00
Stove plate	10.75 to 11.00

*These prices are f.o.b. cars at consumers' mills in the Pittsburgh district.
†Shipping point.

The district sales offices of the Cambria Steel Company, formerly located on the twenty-fourth floor of the Oliver Building, have been moved down to the eighteenth floor, and the traffic and purchasing departments, now located in Johnstown, will occupy quarters on this floor within a few days. J. E. M'Lain, district sales manager, is also located on the eighteenth floor.

Chicago

CHICAGO, ILL., November 26, 1912.

Specifications for steel placed the past week were practically equal in amount to those of the preceding weeks in this month. The Chicago, Rock Island & Pacific Railroad distributed orders for 40,000 tons of 90 and 100-lb. rails and specifications for nearly 20,000 tons of car steel are noted. The local mills of the Steel Corporation, having accepted orders for forward delivery more freely than the independent mills, have their capacity in plates, structural shapes and bars nearly absorbed for the coming year. The latter interests have thus far avoided booking business for later delivery than the first half. Most of the small mills, upon which consumers are depending almost entirely for prompt shipment, have not opened their books for first quarter as yet, being well content with the current business offered at a premium. Even the capacity of these mills is being limited by the supply of semi-finished steel. The pig iron market continues quiet with prices firm. Minimum Southern quotations for first quarter have advanced 50c. a ton. The local market for scrap steel is weaker while consumers' stocks appear ample for their needs.

Pig Iron.—Comparatively few inquiries have come to light. There is some demand for Southern iron, a prospective buyer asking prices on 5000 tons, but this proposition has been postponed indefinitely. A Milwaukee interest is in the market for 1000 to 1500 tons, but the prevailing disposition indicates a willingness to delay further buying in the apparent belief that prices will change but little in the remainder of the year. Some melters who have underestimated their requirements are in the market for small supplemental tonnages of local iron. Inquiry for charcoal iron is also noted. As the result of sales by Southern furnaces for export, aggregating close to 10,000 tons, the minimum quotation of $14, Birmingham, for deliveries through the first quarter has been withdrawn and $14.50 is now the market, with $15 asked for second quarter iron. Local irons continue on the basis of $18 at furnace, with 25c. above this price asked for certain brands. We quote local irons, f.o.b. furnace, the average switching charge to Chicago foundries being about 50c. a ton. Other quotations are for Chicago delivery. Prices on prompt shipment are as follows:

Lake Superior charcoal, Nos. 1, 2, 3, 4	$18.75 to $19.75
Northern coke foundry, No. 1	18.50 to 18.75
Northern coke foundry, No. 2	18.00 to 18.25
Northern coke foundry, No. 3	17.50 to 18.00
Southern coke, No. 1 foundry and No. 1 soft	18.85 to 19.35
Southern coke, No. 2 foundry and No. 2 soft	18.35 to 18.85
Southern coke, No. 3	17.85 to 18.35
Southern coke, No. 4	17.35 to 17.85
Southern gray forge	17.35 to 17.85
Southern mottled	16.85
Malleable Bessemer	18.00 to 18.25
Standard Bessemer	19.40 to 19.90
Basic	18.00 to 18.25
Jackson Co. and Kentucky silvery, 6 per cent	20.40
Jackson Co. and Kentucky silvery, 8 per cent	21.40
Jackson Co. and Kentucky silvery, 10 per cent	22.40

Rails and Track Supplies.—The Chicago, Rock Island & Pacific Railroad has distributed its orders for an aggregate of 40,000 tons of rails, 34,000 tons being placed with the Illinois Steel Company and 1500 tons each with the Lackawanna, Pennsylvania, Cambria and Bethlehem companies. The Union Pacific and Chicago & Northwestern contracts are still unplaced. The buying of track fastenings shows an increase rather than otherwise, the demand being for immediate shipment as well as for spring delivery. The open weather has permitted the prosecution of some construction work that had not been contemplated until spring. We quote standard railroad spikes at 1.95c. to 2.05c., base; track bolts with square nuts, 2.30c. to 2.40c., base, all in carload lots, Chicago; tie plates, $32 to $34.50 net ton; standard section Bessemer rails, Chicago, 1.25c., base; open hearth, 1.34c.; light rails, 25 to 45 lb., 1.25c.; 16 to 20 lb., 1.30c.; 12 lb., 1.35c.; 8 lb., 1.40c.; angle bars, 1.50c., Chicago.

Structural Material.—As distinguished from the apparent willingness of the leading interest to fill its books throughout next year, most of the independent mills are declining to book orders for delivery in the second half. It is not thought possible, however, to continue this policy after the first of the year, so insistent is the pressure being brought to bear by customers. Notwithstanding conditions which may be typified by an instance of a car builder who was unsuccessful in obtaining accommodation from his regular source of supply for 12,000 tons of shapes, plates and bars to be delivered in the third quarter, new business continues to crowd into the market. An order for 5000 tons of structural shapes is noted. It is estimated that the operations of fabricating shops are being curtailed at least 25 per cent. because of delays in obtaining steel. The most important contracts for fabricated work awarded during the week were 8000 tons for the Inspiration Copper Company at Miami, Ariz., and 4000 tons for viaducts for the railroads connecting with the Minnesota Steel Company's plant at Duluth, both taken by the American Bridge Company. This company will also furnish 113 tons for a National Guard armory at Sacramento, Cal. A. Bolter's Sons will fabricate 611 tons for a foundry building for the city of Chicago. The Standard Oil Company bought 140 tons of steel for columns which it will fabricate in its own shop. We quote for Chicago delivery, mill shipment, plain shapes, 1.63c. to 1.90c.

Jobbers are being forced to seek far and wide for structural steel to replenish their stock, and in many instances are paying substantial premiums for such tonnages as they are able to obtain. The trade out of store in November promises to be the heaviest of the year. We quote for base sizes out of store 2.05c.

Plates.—The tonnage of plates available in this market on shipments from mill for delivery within practicable limits is so small as to be negligible. This is particularly true of ¼-in. tank plate. Almost without exception the larger mills are completely filled for the first half while some of the smaller mills that have rolling capacity available lack raw material. We quote for Chicago delivery, mill shipment, 1.63c. to 1.88c.

The resources of local warehouse stocks are being strained to the utmost in the attempt to accommodate an apparently increasing demand for plates out of store. The premiums now being paid by jobbers to replenish their stocks leave but scant margin at the current prices. We quote for base sizes from store 2.05c.

Sheets.—The inability of some of the smaller sheet mills that have been absorbing the current prompt shipment business to obtain an adequate supply of sheet bars has brought an added volume of inquiry to the larger producers. Except for blue annealed sheets local mills are practically out of the market. We quote for Chicago delivery in carloads from mill: No. 28 black sheets, 2.53c.; No. 28 galvanized, 3.68c.; No. 10 blue annealed, 1.83c. to 1.88c.

Store conditions as regards sheets are analogous to those obtaining with respect to other materials. We quote on sheets out of store as follows: No. 10 blue annealed, 2.25c.; No. 28 black, 2.80c., and No. 28 galvanized, 4.05c.

Bars.—The active demand for bar iron has been accentuated by the attempt in several instances to substitute iron for steel. One inquiry for 1000 tons is of this character. Other inquiries in this market total approximately 4000 tons. Consumers continue to buy as heavily as possible, and on one inquiry for 200 tons of iron bars a railroad sent specifications for nearly 600 tons with its order. A similar instance in the case of hard steel bars is noted where a consumer had his order for 350 tons accepted and submitted 800 tons. For bar iron the minimum price is 1.55c. and for hard steel bars 1.65c. The nominal price for soft steel bars continues at 1.40c., Pittsburgh, but current business for early delivery is generally placed at 1.45c. and 1.50c. We quote for mill shipment as follows: Bar iron, 1.55c. to 1.60c.; soft steel bars, 1.58c. to 1.65c.; hard steel bars, 1.60c. to 1.70c.; shafting in carloads, 60 per cent. off; less than carloads, 55 per cent. off.

For delivery from store, we quote soft steel bars, 1.95c.; bar iron, 1.95c.; reinforcing bars, 1.95c. base with 5c. extra for twisting in sizes ¼ in. and over, and 7½c. extra for smaller sizes; shafting 55 per cent. off.

Rivets and Bolts.—Recent contracting for rivets has been of an extent sufficient to absorb most of the local capacity for the first half of the year, and prices are now firmly on the basis of 2.28c. We quote from mill as follows: Carriage bolts up to ⅜ x 6 in., rolled thread, 75-10-2½; cut thread, 75-7½; larger sizes, 70-5; machine bolts up to ⅜ in. x 4 in., rolled thread, 75-10-7½; cut thread, 75-10-2½; large sizes, 70-10; coach screws, 80-10; hot pressed nuts, square head, $5.80 off per cwt.; hexagon, $6.40 off per cwt. Structural rivets, ¾ to 1¼ in., 2.28c., base, Chicago, in carload lots; boiler rivets, 0.10c. additional.

Out of store we quote for structural rivets, 2.70c., and for boiler rivets, 2.90c. Machine bolts up to ⅜ x 4 in., 70-12½; larger sizes, 65-10; carriage bolts up to ⅜ x 6 in., 70-10; larger sizes, 65-5 off. Hot pressed nuts, square head, $5.40, and hexagon, $6 off per cwt.

Wire Products.—Fall building operations have been so prolonged as to materially increase the volume of wire nail consumption. The tonnage of plain wire being ordered for the manufacturing trade is also heavy. The heavy demand for wire products and the very general stability of prices are understood to be forerunners of an advance of $1 a ton. We quote plain wire, No. 9 and coarser, base, $1.68 to $1.73; wire nails, $1.88 to $1.93; painted barb wire, $1.88 to $1.93; galvanized, $2.28 to $2.33; polished staples, $1.88 to $1.93; galvanized, $2.28 to $2.33, all Chicago.

Cast Iron Pipe.—The award of 300 tons of pipe at La Crosse, Wis., scheduled for the past week, has not yet been made. At Detroit a letting of 300 tons of high pressure pipe is pending. In general there is little activity. We quote as follows, per net ton, Chicago: Water pipe, 4 in., $31; 6 to 12 in., $29; 16 in. and up, $28, with $1 extra for gas pipe.

Old Material.—The scrap market continues to sag, and prices generally are lower than a week ago. For some grades, such as heavy melting and shoveling steel scrap, our quotations are largely nominal as there have been practically no transactions in the past two weeks. There still remains in this market a general supply of scrap out of proportion to consumers' requirements. Railroad offerings of old material were heavier the past week, totaling nearly 7000 tons. Of this, the Chicago, Burlington & Quincy has 2200 tons; Chicago, Rock Island & Pacific, 2800 tons; Chicago, Milwaukee & St. Paul, 1400 tons, and Chicago & Alton, 300 tons. The principal items on these lists were about 1200 tons of Nos. 1 and 2 railroad wrought, 800 tons of iron rails, 500 tons of steel rails and 300 tons of railroad malleable. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton.

Old iron rails	$18.00 to $18.50
Old steel rails, rerolling	16.25 to 16.75
Old steel rails, less than 3 ft.	14.50 to 15.00
Relaying rails, standard section, subject to inspection	24.00
Old car wheels	16.75 to 17.25
Heavy melting steel scrap	13.00 to 13.50
Frogs, switches and guards, cut apart	13.00 to 13.50
Shoveling steel	12.75 to 13.25
Steel axle turnings	11.00 to 11.50

Per Net Ton.

Iron angles and splice bars	$16.00 to $16.50
Iron arch bars and transoms	16.75 to 17.25
Steel angle bars	12.75 to 13.25
Iron car axles	21.50 to 22.00
Steel car axles	17.75 to 18.25
No. 1 railroad wrought	13.00 to 13.50
No. 2 railroad wrought	12.00 to 12.50
Cut forge	12.00 to 12.50
Steel knuckles and couplers	12.75 to 13.25
Steel springs	13.25 to 13.75
Locomotive tires, smooth	14.00 to 14.50
Machine shop turnings	8.25 to 8.75
Cast and mixed borings	7.00 to 7.50
No. 1 busheling	11.25 to 11.75
No. 2 busheling	8.25 to 8.75
No. 1 boilers, cut to sheets and rings	9.50 to 10.00
Boiler punchings	12.50 to 13.00
No. 1 cast scrap	13.00 to 13.50
Stove plate and light cast scrap	10.75 to 11.25
Railroad malleable	13.50 to 14.00
Agricultural malleable	11.75 to 12.25
Pipes and flues	10.25 to 10.75

Philadelphia

PHILADELPHIA, PA., November 26, 1912.

Minimum prices of standard brands of foundry pig iron show an advance of 25c. a ton. Pronounced firmness continues in practically all iron and steel products and the volume of business shows no diminution. Inquiry for rolled steel products for extended delivery is greater, with further first quarter contracting. The Philadelphia & Reading Railroad has placed orders for 25,000 tons of steel rails for 1913 and several other still larger purchases have been practically closed. Reports of an order for another large vessel for the Pacific coast trade are heard, but it will involve no purchase of materials, options having been entered some months ago in connection with other business. Bars are very scarce, and prompt shipments command sharp premiums. The coke situation is quiet. Old material, while not quotably lower in price, is easier.

Iron Ore.—Eastern furnaces are negotiating for more Lake ore for 1913 delivery, which is quoted usually about 10c. below the basis in force for 1911. There is little movement in foreign ore. One seller of Canadian ore has as yet closed little 1913 business. The available supply of Wabana ore for next year has practically been disposed of. Importations during the week were confined to Cuban ore, of which 12,850 tons was received.

Pig Iron.—Foundry grades continue fairly active, although the bulk of the sales have been in small lots. Negotiations for iron for early 1913 shipment that had been pending have been closed, including 1500 tons in one and 600 tons in another lot, taken by the local locomotive builder. Upward of 1500 tons of Virginia and eastern Pennsylvania foundry iron has been taken by a western New Jersey consumer, while several 500 to 1000 ton lots, involving early as well as first half of next year delivery, have been reported closed. Standard brands of eastern Pennsylvania No. 2 X foundry are now on a minimum basis of $18.50, while $18.75 and even $19 have been done, although sales at the high level have of course been of an exceptional nature. Virginia No. 2 X foundry is still available at $16, furnace, for prompt or near future shipment, although the leading interest is now sold up on this grade for the first half of next year, quoting No. 2 plain for first quarter at $15.75 and for second quarter at $15.25. Sales of small lots of Eastern malleable pig have been made for early delivery. Negotiations for considerable tonnage in low grade pipe making iron are still pending, definite inquiries for 3000 tons from a Delaware River company and for 3500 tons from a Virginia company being reported unclosed. Other pipe makers, while not definitely in the market, would take bargain lots. Purchases of rolling mill forge iron by consumers in the Schuylkill Valley are reported.

One has taken an aggregate of 15,000 tons in the past few weeks and is understood to be still in the market. For this grade $17.75, delivered, is the usual quotation, although higher prices are asked by some producers. Two lots of basic iron of 2500 tons each were taken by a central Pennsylvania consumer for prompt shipment. Rather peculiar circumstances surround these transactions, which were made at a price somewhat under $18.25, delivered. Consumers of basic in this district, with possibly one exception, are now pretty well provided for requirements through the first quarter of next year, while furnaces are closely sold up, quoting from $18.25 to $18.75, although the higher quotation is considered prohibitive. An aggregate of 1000 tons of standard analysis low phosphorus pig has been sold, all at $24.50, delivered, although $24 can in instances still be done. The strength of the pig iron market is fully maintained. Several producers are practically out of the market for delivery up to the end of the first quarter and are not free sellers for more extended shipment. Many consumers of foundry iron are urging shipments on orders, some having been confronted with temporary suspension owing to non-delivery of contract iron. Prices are very firm, except probably for basic iron, which has indicated some weakness, notwithstanding the strong attitude of the majority of producers. For delivery in buyers' yards in this district standard brands for shipment extending into the early part of next year range about as follows:

Eastern Pennsylvania No. 2 X foundry	$18.50 to $18.75
Eastern Pennsylvania No. 2 plain	18.25 to 18.50
Virginia No. 2 X foundry	18.80 to 19.00
Virginia No. 2 plain	18.55 to 18.75
Gray forge	17.75
Basic (nominal)	18.25 to 18.50
Standard low phosphorus	24.00 to 24.50

Ferroalloys.—The local demand has been extremely light. Consumers are pretty well covered as far as the near future is concerned, and deliveries on contracts have been coming in freely. Quotations for 80 per cent. ferromanganese still show irregularity, but $61, seaboard, continues to be quoted for second half. Prompt carload sales have been made at $75, seaboard. Very little movement in ferrosilicon is noted and prices are unchanged. Upward of 1000 tons of ferromanganese was received at this port during the week.

Billets.—Consumers would contract for extended requirements, but as mills in this district are well sold ahead they are not taking new orders for the near future and refuse to consider business for extended delivery. Quotations are maintained at $32, delivered here, for soft basic open hearth rolling billets. Sales of moderate lots of Bessemer billets at $30.40, delivered, are reported. Ordinary forging billets command $36, Eastern mill, when available, but both rolling and forging billets are scarce and when they can be had for early delivery command sharp premiums.

Plates.—Although Eastern mills continue to make record productions from week to week, further delays are experienced in making deliveries, as orders in excess of the daily make continue to be received. In but few instances can new orders be taken and delivery insured during the remainder of the year. More extensive contracting for first quarter requirements is noted, Eastern mills entering such orders usually at current quotations, which are 1.75c. for sheared and 1.80c. minimum for universal plates, delivered in this district. Considerable inquiry for car building plates is still before the trade, the recent large inquiry for the Norfolk & Western Railway being reported as still unclosed. The market is firm. Some producers are practically sold up for the first half of next year.

Structural Material.—Most mills are sold up for months ahead, although occasional prompt shipments can be made by filling in against early rollings. New business is mostly of a miscellaneous character, although some moderate bridge and building work has been closed. About 1500 tons of structural work will be required for the proposed addition to the Arcade Building. The erection of a 20-story office building on the old Mint Arcade site and another large office building on South Penn Square are in prospect. Prices are unchanged. For reasonable delivery, 1.70c. to 1.75c., delivered, is usually named for plain shapes, although Western shapes for uncertain delivery are still quoted at 1.60c., delivered here.

Sheets.—Eastern mills continue to receive numerous inquiries and are entering a very satisfactory volume of business. Deliveries are often considerably delayed, although premiums are offered for early shipment. Western sheets for prompt delivery are scarce. Specifications are being placed freely, and mills are operating at top capacity. Western No. 10 blue annealed sheets are quoted at 1.80c. here, with delivery uncertain, while Eastern mills, making smooth, loose-rolled sheets, easily obtain up to 2.05c., delivered, for reasonably early shipment.

Bars.—The demand for both iron and steel bars continues good, while deliveries are steadily becoming harder. In but few instances are prompt bars available, and when they can be had it is usually in small lots and at a sharp premium. Mills are being urged for deliveries against specifications, but satisfactory shipments are hard to get. While orders can still be entered at 1.67½c., delivered, shipment against such orders is uncertain, and fairly prompt shipments command from 1.75c. to 2c., delivered. Steel bars for prompt shipment have been sold at 1.85c., delivered, although business for extended shipment is still entered at 1.55c. to 1.60c., delivered.

Coke.—The market has an easier appearance, both as to prices and volume of business. Little movement in furnace coke, either on contract or prompt shipment, is reported. Consumers are not disposed to pay over $3 at oven for contract furnace coke, although up to $3.50 is asked; prompt furnace coke is available at $3.75. Foundry coke has been quiet, with $4 quoted for contract and $4.50 for prompt shipment. The following range of prices, per net ton, is named for delivery in buyers' yards in this district:

Connellsville furnace coke	$5.00 to $5.75
Connellsville foundry coke	6.00 to 6.50
Mountain furnace coke	4.50 to 5.50
Mountain foundry coke	5.60 to 6.25

Old Material.—Consumers are so well supplied that they show little interest in the market, and material that sellers must move usually goes at inside figures. Prices, while not quotably lower, are easier in nearly every grade. Sales of No. 1 heavy melting steel have been made in moderate lots at $15.50, delivered, but the demand is not sharp. Some mills would buy for extended delivery, but sellers are not inclined to accept such contracts. Consumption is heavy, but the increased activity of mills and factories has resulted in much heavier supplies in practically all grades. The following range of prices is named for prompt delivery in buyers' yards in this district, covering eastern Pennsylvania and nearby points, taking a freight rate ranging from 35c. to $1.35 per gross ton:

No. 1 heavy melting steel scrap and crops	$15.50 to $15.75
Old steel rails, rerolling (nominal)	17.00 to 17.50
Low phosphorus heavy melting steel scrap	19.25 to 19.75
Old steel axles	20.00 to 20.50
Old iron axles	26.00 to 27.00
Old iron rails	19.00 to 20.00
Old car wheels	15.00 to 15.50
No. 1 railroad wrought	17.00 to 17.50
Wrought iron pipe	14.00 to 14.50
No. 1 forge fire	13.50 to 14.00
No. 2 light iron (nominal)	8.00 to 8.50
Wrought turnings	11.50 to 12.00
Cast borings	11.50 to 11.75
Machinery cast	14.75 to 15.25
Grate bars, railroad	11.50 to 12.00
Stove plate	11.50 to 12.00
Railroad malleable (nominal)	13.50 to 14.00

Boston

BOSTON, MASS., November 26, 1912.

Old Material.—The market is weaker and prices have receded a little on heavy melting steel, skeleton, cotton ties, turnings and borings. The trade looks for an easy market until after the beginning of the new year. The quotations given below are of prices offered by the large dealers to the producers and to the small dealers and collectors, per gross ton, carload lots, f.o.b. Boston and other New England points which take Boston rates from eastern Pennsylvania points. In comparison with Philadelphia prices the differential for freight of $2.30 a ton is included. Mill prices are approximately 50c. a ton more than dealers' prices:

Heavy melting steel	$12.00 to $12.25
Low phosphorus steel	14.00 to 15.00
Old steel axles	15.00 to 15.50
Old iron axles	23.00 to 23.50
Mixed shafting	14.75 to 15.25
No. 1 wrought and soft steel	12.25 to 12.75
Skeleton (bundled)	10.50 to 11.00
Wrought iron pipe	10.75 to 11.00
Cotton ties (bundled)	10.50 to 10.75
No. 2 light	4.50 to 5.00
Wrought turnings	8.00 to 8.25
Cast borings	7.75 to 8.00
Machinery, cast	13.50 to 14.00
Malleable	11.00 to 11.50
Stove plate	9.00 to 9.50
Grate bars	8.00 to 8.25
Cast-iron car wheels	13.50 to 14.00

Cincinnati

CINCINNATI, OHIO, November 26, 1912.

Pig Iron.—The soft spots that have lately developed in the Southern iron situation can be charged to some extent to several dealers who anticipated the market some time ago, and now have a limited quantity of iron to move that was bought at much lower prices. The amount of this resale iron is hardly enough to justify any reduction in present quotations. While a considerable part of it has been disposed of below $14, Birmingham basis, there have been more than an equal number of small sales made at the figure named for this year's shipment. For delivery in the first quarter, prices range all the way from $14 to $14.50, and there are quotations on second quarter business as high as $15, Birmingham. Both Southern and Northern producers are shipping iron as fast as made, but the Northern furnaces appear to be on a more independent basis, and if there is any strictly No. 2 foundry obtainable below $17, Ironton, for this year's shipment, it is a negligible quantity. However, this quotation has been extended, in some instances, to cover first half business. Inquiries are few, but a northern Ohio buyer is expected to close for approximately 1000 tons of Northern foundry iron before the week has passed. A melter in the Pittsburgh district wants 500 tons of charcoal iron, and there are several unclosed orders in Michigan and Indiana territory for both Northern and Southern foundry iron for first half shipment. A Michigan melter recently booked 700 tons of Northern foundry iron, and a Central Western consumer bought 1000 tons of high sulphur Southern iron. Malleable and basic are not in demand in this territory. Based on freight rates of $3.25 from Birmingham and $1.20 from Ironton we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry and 1 soft	$17.50 to $18.00
Southern coke, No. 2 foundry and 2 soft	17.25 to 17.50
Southern coke, No. 3 foundry	17.00 to 17.50
Southern, No. 4 foundry	16.75 to 17.25
Southern gray forge	16.50 to 17.00
Old silvery, 8 per cent. silicon	20.20 to 20.70
Southern Ohio coke, No. 1	18.70 to 19.20
Southern Ohio coke, No. 2	18.20 to 18.70
Southern Ohio coke, No. 3	17.95 to 18.45
Southern Ohio malleable Bessemer	17.70 to 18.20
Basic, Northern	18.20 to 18.70
Lake Superior charcoal	19.25 to 19.75
Standard Southern car wheel	25.75 to 26.25

Coke.—Excellent weather conditions have relieved the coke situation to a small extent, but spot coke in all three districts is still very firm at prices that would have been considered prohibitive three months ago. A small sale of 48-hr. Connellsville coke was made last week by a local firm at $4 per net ton at oven for prompt shipment, and it is hardly probable that anything less than this can be done on standard brands, while foundry grades are bringing around $4.25 to $4.50, and one car went for domestic use at $5. The contract price on furnace coke in the Connellsville, Wise County and Pocahontas districts now ranges all the way from $3 to $3.50 per net ton at oven for first half shipment, $3.25 about representing the average price at which contracting can be done. Foundry coke is about 25c. to 50c. a ton higher. A local agency is working on a request for prices on two yearly contracts that will average between 8000 and 10,000 tons a month of 48-hr. coke.

Finished Material.—A number of building projects in this territory will require a fairly large amount of structural material. These include buildings in Cincinnati, Dayton and Columbus, but the principal concern of both the mill agencies and contractors is the question of deliveries. The mills are so far behind that, with the continued heavy demand, there is hardly any chance for them to catch up before the spring building season begins. So far as known, there have been no cancellations on account of the recent election. Steel bars for prompt shipment are bringing a premium and are hardly obtainable below a minimum of 1.50c., Pittsburgh basis. Sheets continue active, and the local mill is not able to promise deliveries under six to eight weeks. Local warehouse business is excellent, with no change in previous quotations of 2.15c. on steel bars and 2.25c. on structural material.

Old Material.—Prices have dropped about 25c. a ton on all classes of scrap. Even this figure is more than conservative on some grades. Dealers have a great quantity on hand, and a number of their customers, including the rolling mills, who are large users, are not now making any extensive purchases. The figures given below represent what buyers are willing to pay for delivery in their yards, southern Ohio and Cincinnati, and the maximum quotations are dealers' prices, f.o.b. at yards:

Per Gross Ton.

Bundled sheet scrap	$10.25 to $10.75
Old iron rails	14.50 to 15.00
Relaying rails, 50 lb. and up	21.50 to 22.00
Rerolling steel rails	13.50 to 14.00
Melting steel rails	11.50 to 12.00
Old car wheels	13.00 to 13.50

Per Net Ton.

No. 1 railroad wrought	$11.50 to $12.00
Cast borings	7.50 to 8.00
Steel turnings	8.00 to 8.50
No. 1 cast scrap	11.25 to 11.75
Burnt scrap	8.00 to 8.50
Old iron axles	18.50 to 19.00
Locomotive tires (smooth inside)	12.00 to 12.50
Pipes and flues	8.00 to 8.50
Malleable and steel scrap	9.50 to 10.00
Railroad tank and sheet scrap	7.00 to 7.50

Klein & Cohn, scrap iron and steel and old metals, have removed from 828 Wade street to their new office and railroad yards at 731 to 741 Reading road, Cincinnati, Ohio.

Birmingham

BIRMINGHAM, ALA., November 25, 1912.

Pig Iron.—Whether it was the stimulus caused by the sale of 5000 tons of Birmingham pig iron for first quarter delivery at south Austrian and Italian ports at an advance over the $14.50 basis, or whether due to a general view of market conditions, the only considerable iron maker with iron to sell heretofore adhering to the $14 level for spot and first quarter has advanced to $14.50 for these deliveries and $15 for the second quarter. The high prices of foreign iron enabled Birmingham to secure the premium over the $14.50 level. The leading interest is not wavering in its demand for $14.50 for first and $15 for second quarter and another prominent producer adheres to $14.50 through first quarter with no business for second quarter yet sought. The fourth large operator, which claimed at the same time that it was scarcely to be considered in the market, said it would put the present Birmingham level at $14 for spot, $14.50 for first and $15 for second quarter. Small lots have been sold at $15 for second quarter delivery, but no large business has been done. Owing to difficulty in assembling raw materials production will not increase as rapidly as was expected. The new furnace of the Central Foundry Company at Holt is completed, and it is to be blown in in the immediate future. A small lot of No. 4 for first quarter delivery brought $14. The 25 cents differential below No. 2 is generally maintained. One small lot of No. 2 for spot sold at $14 and one of No. 3 at $13.50. The quotations for Birmingham pig iron given below must be taken into consideration along with the foregong information, the $14 figure being retained for No. 2 as the absolute minimum. On this basis quotations, f.o.b. furnaces at Birmingham, are continued as follows:

No. 1 soft and foundry	$14.50 to $15.00
No. 2 soft and foundry	14.00 to 14.50
No. 3 foundry	13.75 to 14.25
No. 4 foundry	13.50 to 14.00
Gray forge	13.25 to 13.75
Basic	14.00 to 14.50
Charcoal	25.00 to 25.50

Cast Iron Pipe.—Several fill-in orders from Western points arrived in the week and the outgo has been very large. Manufacture is at full ebb. Prices continue f.o.b. shops as follows, per net ton: 4 in., $25; 6 in. and up, $23, with $1 added for gas pipe.

Old Material.—Dealers are taking in large stocks and shipping with some dispatch. All grades appear to be in demand, especially light stove and cast material, with no inconsiderable trade in steel. Prices are continued f.o.b. cars at dealers' yards as follows, per gross ton:

Old iron axles	$16.50 to $17.50
Old steel axles	15.50 to 16.00
Old iron rails	14.50 to 15.00
No. 1 railroad wrought	13.00 to 13.50
No. 2 railroad wrought	11.50 to 12.00
No. 1 country wrought	9.50 to 10.00
No. 2 country wrought	9.00 to 9.50
No. 1 machinery cast	11.50 to 12.00
No. 1 heavy melting steel	11.50 to 12.00
Tram car wheels	12.00 to 12.50
Standard car wheels	13.00 to 13.50
Light cast and stove plate	9.50 to 10.00

Coal and Coke.—Coke is very strong and inquiry is brisk. Very few Alabama ovens are idle and the idle ones will probably be brought in soon. Foundry coke continues at $3.50 to $3.75 per net ton at oven. The output of coal is at a maximum but checked by an intermittent scarcity of cars. The railroads are handling the situation pretty well and it is not expected it will become acute.

British Markets Continue Active

Big Buying of Hematite (Bessemer) Pig Iron—Welsh Steel Works Short of Raw Material

(*By Cable*)

MIDDLESBROUGH, ENGLAND, November 27, 1912.

European politics dominate speculative sentiment. Pig iron remains firm. Big buying of hematite (Bessemer) has occurred for delivery over next year. Semi-finished steel is strong. Welsh steel works are unable to operate regularly for want of hematite iron. Consumers of sheet bars are unable to get regular deliveries. Better inquiry is coming out for billets. Stocks of pig iron in Connal's stores are 251,387 tons, a reduction of 2073 tons in the week. We quote as follows:

Cleveland pig iron warrants (closing Tuesday), 67s. 8½d., against 68s. ½d. one week ago.

No. 3 Cleveland pig iron, maker's price, f.o.b. Middlesbrough, 68s. 3d., a decline of 3d. in the week.

Steel sheet bars (Welsh) delivered at works in Swansea Valley, £6 for January-March delivery, an advance of 2s. 6d.

German sheet bars, f.o.b. Antwerp, 112s. 6d., an advance of 2s. 6d.

German 2-in. billets, f.o.b. Antwerp, 105s.

German basic steel bars, f.o.b. Antwerp, £6 6s., an advance of 2s.

Steel bars, export, f.o.b. Clyde, £8.

Steel joists, 15-in., export, f.o.b. Hull or Grimsby, £7 10s.

German joists, f.o.b. Antwerp, £5 12s. to £5 15s.

Steel ship plates, Scotch, delivered local yard, £8 7s. 6d., an advance of 5s.

Steel black sheets, No. 28, export, f.o.b. Liverpool, £9 15s.

Steel rails, export, f.o.b. works port, £6 15s.

Tin plates, cokes, 14 x 20, 112 sheets, 108 lb., f.o.b. Wales, 15s. 3d., a decline of 1½d.

Steel Scarcity Accentuated—Tin Plate Manufacturers Uneasy Over the Outlook

MIDDLESBROUGH, November 16, 1912.

At the moment of writing the tension between Austria and Russia seems to have been allayed, and negotiations for peace between Turkey and the Balkan States have been begun, but people are still nervous. Actually the industrial situation remains as it was, for in every direction the works are well employed, and mostly specifications are coming along briskly; but the lurking fear that bad trouble was brewing upset things just when a more cheerful view was being taken. With all the prophets of evil croaking at once, it is simply marvelous that prices of iron and steel products should have held together so well, and it only serves to show upon how firm a foundation the markets rest. A coldly critical examination of the position reveals no ground for apprehension apart, of course, from politics. Prices will have to come down some day, but there really seems nothing to be afraid of for a few months at any rate.

American Steel Works and British Trade

There is a pressing scarcity of half finished steel, so much so that it is quite a common thing for Welsh tin plate works to be closed for a day or a couple of days at a time, because they have no bars to go on with. Not only does this cause great inconvenience to makers, but it is leading to trouble with the men. Sheet bars for near delivery are for all practical purposes nonexistent. The German Verband will only book for far ahead delivery; the Belgians will not quote; the French, who are occasionally a stand-by, have trouble in meeting their engagements, and when the Americans quote it is such a price that the inquirer feels he has wasted his time. It is very satisfactory to know that deliveries are coming along regularly from the United States, as it gives confidence to buyers. While touching on this point, let me suggest that those of your manufacturers who at some considerable expense have been cultivating this market should regularly set aside a certain tonnage of matrial for the export trade, regardless altogether of the excellence of domestic trade. Failing something of this sort, they stand to lose part of their connection, and all for the sake of a comparativey small sacrifice in times of exceptional prosperity. I am personally convinced that such a policy is an enlightened one, and in accordance not only with the spirit of the times, but with sound economics. It is well worth the consideration of the independent mills whose product has been so well received.

Considerable slackness is overtaking the tin plate market in which the demand has tapered off surprisingly, and it is a hard matter to get hold of specifications, while merchants are cutting prices sharply to market holdings. Makers are far from sanguine. The continued incursion of American mills into what have for years been regarded by the Welshmen as their own particular preserves, and the appearance of the United States as a big exporting country, together with the steady development of plants in Germany, France and Italy, all of which threaten in the natural sequence of events to cut off lucrative markets from South Wales, are regarded as events of the gravest moment. Nevertheless a new plant is projected at Aberavon.

The quarterly returns of the Middlesbrough Chamber of Commerce show that there are 78 blast furnaces in the port, of which at the end of September 60 were in operation and had produced, in the third quarter of one year, 590,000 tons of pig iron, 380,000 tons of which was Cleveland pig, and 210,000 tons hematite, spiegel, basic and other special irons. These figures compare well with a total output of 520,000 tons in the previous three months, and 565,000 tons in the third quarter of last year. The imports of foreign ore last quarter reached 627,851 tons, against 338,378 tons in the previout quarter. The imports of iron ore in the first nine months of the year were 1,461,447 tons.

Buffalo

BUFFALO, N. Y., November 26, 1912.

Pig Iron.—The market is very strong and the demand in new business for prompt and first quarter shipment covering most grades exceeds the capacity of furnaces. One large producing interest of this center is so heavily sold up as practically to have retired from the market for deliveries between now and July 1. All its sales agents have been instructed to accept no orders without first referring to their principals. As a rule neither sellers nor buyers appear to be much interested in the last half of 1913. One interest states that $18 per ton at furnace is now its minimum price for any grade for current or first quarter delivery and only small lots can be taken even at this price. The aggregate of sales by all furnaces in the district for the week is about 40,000 tons, equally divided between the domestic and the Canadian export trade. The former includes over 5000 tons of charcoal iron, also some high phosphorus and high silicon iron as well as regular foundry grades, pipe iron and malleable. One Canadian steel making interest is stated to have contracted for 10,000 tons of basic and a Canadian foundry has taken 10,000 tons of malleable. There is a continued active and urgent demand for coke. We quote as follows for first half delivery, f.o.b. Buffalo:

No. 1 foundry	$18.00 to $18.25
No. 2 X foundry	17.75 to 18.00
No. 2 plain	17.50 to 17.75
No. 3 foundry	17.25 to 17.50
Gray forge	17.00 to 17.25
Malleable	18.00 to 18.25
Basic	18.00 to 18.25
Charcoal, regular brands and analysis	18.75 to 19.25
Charcoal, special brands and analysis	22.00

Finished Iron and Steel.—Demand and prices hold up strongly. Specifications on contracts, although of liberal volume, are not quite so heavy as for some weeks past, but even with this seasonable lull mills are taxed to their maximum limit to keep abreast of promised obligations and many of them are unable to accept orders for rolling before the third quarter. Orders booked in all lines for November, though smaller than for October, September or August, were far ahead of the total for November of last year. In the wire market one of the most serious developments in recent weeks is the scarcity of rods. Several rod producers, owing to their inability to procure a sufficient quantity of steel, have been forced to reduce their output of rods, embarrassing some of the independent wire mills which do not roll their own rods. In hoops delivery promises have to be made further ahead, now being extended to four and five months instead of three to four months. The situation in structural material continues

strong, with delivery promises now reaching into the third quarter. Bids are to be received November 29 for the 300 tons of steel for the Foster-Milburn Company's factory and laboratory, this city. The Buffalo Structural Steel Company will erect the power house for the Crosby Company's plant, Pratt street, Buffalo, taking 100 tons, and also the forestry building and the headquarters building for the agricultural department of Cornell University, Ithaca, taking 175 tons each.

Old Material.—The market has shown a slight falling off in activity but a fair amount of new business has been transacted and foundries and mills are taking contract material in good volume. Prices are not quotably changed from last week and range as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	$14.75 to $15.25
Low phosphorus steel	17.00 to 17.50
No. 1 railroad wrought	16.00 to 16.50
No. 1 railroad and machinery cast scrap	14.00 to 15.00
Old steel axles	16.75 to 17.00
Old iron axles	24.50 to 25.00
Old car wheels	15.50 to 16.25
Railroad malleable	13.50 to 14.00
Boiler plate, sheared	15.00 to 15.50
Locomotive grate bars	11.75 to 12.25
Wrought pipe	10.50 to 11.00
Tank iron	10.75 to 11.25
Wrought iron and soft steel turnings	8.75 to 9.00
Clean cast borings	8.00 to 8.50

St. Louis

ST. LOUIS, MO., November 25, 1912.

While the market generally has been quiet it is held that the only occasion for it is that large consumers are well provided for, at least until after the first of the year, though they are buying small lots for special purposes or to fill in immediate needs. Request for immediate shipment of new orders or specifications on contracts continues.

Finished Iron and Steel.—A large smelter deal, for Arizona, about 6000 tons, is being considered. Specifications on contracts are fair, but business generally is good and it is stated that up to date the total of orders is in excess of the same period in October. In bars consumption is evidently increasing, demands for shipment indicating that the material is going into immediate use. In standard rails nothing developed in the week. The total of the contracts so far made in this market for the coming year's delivery is said to be 65,000 tons. Track fastenings have been in good demand at firm prices. In light rails there has been renewed activity of the coal interests. The only plates being handled here are those covered by contract. The agricultural and wagon interests are busy and their consumption of material is large.

Old Material.—The scrap market has firmed up still more, though with few material changes in quotations. The steel foundry activities have put scrap in good demand but stocks are low and the railroads, because of the season, are not offering much material for the scrap dealers to take up. Rolling mills are reported pretty well booked into next year and this is expected to keep the demand for scrap up well into the coming year, with higher prices looked for in consequence. Relaying material continues strong, with stocks lighter than ever. Lists out during the week include the Chicago & Eastern Illinois, 300 tons, the Frisco about 100 tons, Vandalia 350 tons and the Rock Island about 3500 tons. We quote dealers' prices f.o.b. St. Louis as follows:

Per Gross Ton.

Old iron rails	$15.50 to $16.00
Old steel rails, rerolling	15.50 to 16.00
Old steel rails, less than three feet	15.00 to 15.50
Relaying rails, standard section, subject to inspection	24.00 to 25.00
Old car wheels	15.50 to 16.00
Heavy melting steel scrap	15.00 to 15.50
Frogs, switches and guards cut apart	14.50 to 15.00

Per Net Ton.

Iron fish plates	$12.50 to $13.00
Iron car axles	20.50 to 21.00
Steel car axles	17.00 to 17.50
No. 1 railroad wrought	13.00 to 13.50
No. 2 railroad wrought	12.00 to 12.50
Railway springs	12.25 to 12.75
Locomotive tires, smooth	13.00 to 13.50
No. 1 dealers' forge	10.00 to 10.50
Mixed borings	8.00 to 8.50
No. 1 busheling	11.00 to 11.50
No. 1 boilers cut to sheets and rings	8.50 to 9.00
No. 1 cast scrap	12.50 to 13.00
Stove plate and light cast scrap	9.50 to 10.00
Railroad malleable	12.00 to 12.50
Agricultural malleable	11.00 to 11.50
Pipes and flues	8.50 to 9.00
Railroad sheet and tank scrap	8.00 to 8.50
Railroad grate bars	10.00 to 10.50
Machine shop turnings	9.00 to 9.50

Pig Iron.—Sales have been for carloads, and 50-ton and 100-ton amounts with several contracts for 500 tons each. An instance of the manner in which pig is going into use is shown in the case of a purchaser who had contracted as far ahead as the second quarter, but has now used all his allotment for the last quarter and bought 500 tons for December shipment at the market, the furnace being unwilling to anticipate shipment on the first quarter allotment. Inquiries include one for 300 tons of ferromanganese.

Coke.—The difficulty of getting shipment makes transactions very difficult, for either prompt or future delivery, the former because of car and labor shortage and the latter because of the uncertainty as to the proper price. Foundry grades, best 72-hr. selected Connellsville, have been quoted at $4.50 to $5 for prompt shipment at oven, while the figure on contracts has been put at $4, but the absence of business of large amount makes the figures nominal.

Cleveland

CLEVELAND, OHIO, November 26, 1912.

Iron Ore.—Sales for 1913 delivery have been made in fairly good volume since the establishment of prices a week ago. An interesting feature is the active demand from Eastern furnaces for Lake Superior ores. One firm has sold over 500,000 tons to Eastern consumers in lots up to 150,000 tons and other Eastern sales are reported, making an aggregate of probably over 1,000,000 tons taken for the East. In addition a number of inquiries from the East are now pending. These sales have been practicaly all in non-Bessemer grades and were made to companies that used little or no Lake Superior ore last year. This demand for Lake Superior ores is attributed to the fact that owing to the general prosperity in the iron and steel industries in the European countries, the bulk of the foreign ore will be needed abroad during the coming year. The high ocean freight rate is another factor in the situation. Reservations made previous to the establishment of prices have been converted into contracts which cover practically all of the Bessemer ore. Aggregate sales of non-Bessemer ores to consumers in the Central West up to the present time have not been large, these sales being almost entirely in the higher grades of ore. Many of the independent furnace interests are following a conservative policy and are deferring purchases. Some of these state that they will not buy their ore before next May. At that time they expect to have the output of their furnaces largely sold for the last half of 1913, so that by deferring purchases until spring they will not be taking chances on the market nearly 18 months ahead but only on the first four or five months of 1914, during which they will still be using 1913 ore. As stated last week the guarantee of iron content is unchanged at 55 per cent. for Bessemer and 51.50 per cent. for non-Bessemer. Buyers of some grades of non-Bessemer are given a slight advantage in the new 1913 contracts. In previous years a premium in addition to the base unit value has been charged on ores running over 53 per cent. natural, this premium being 1c. on ores 53 to 54 per cent. natural, 2c. additional on ores 54 to 55 per cent., 3c. additional on ores 55 to 56 per cent., 4c. additional on ores 56 to 57 per cent., and 5c. additional on ores 57 to 58 per cent. On non-Bessemer grades only, these former premiums are not now being charged in the new contracts. However, the proportion of non-Bessemer grades which runs above 53 per cent. in iron is not large. We quote prices as follows: Old Range Bessemer, $4.40; Mesaba Bessemer, $4.15; Old Range non-Bessemer, $3.60, and Mesaba non-Bessemer, $3.40.

Finished Iron and Steel.—There is considerable new inquiry both for contracts and for material for specific work, but mills generally are declining to take on additional tonnage, though in some cases regular customers are being taken care of with steel bar contracts. Practically no material can be had for early delivery except from warehouses, and consumers in need of steel for prompt shipment are buying from jobbers at stock prices. Some mills have specifications on practically all the material they have under contract. With others specifications continue heavy. Quotations are unchanged at 1.40c. to 1.45c. for steel bars and 1.45c. to 1.50c. for plates and shapes for future delivery. Eastern mills are making a minimum quotation of 1.60c. on plates and 1.65c. on structural material for delivery in this territory, but are asking $1 to $2 advance over these prices for shipment in 30 to 90 days. Bids will be received December 20 for completing the city hall in Cleveland, requiring 500 tons in addition to 3700 tons previously contracted for. Considerable other struc-

tural work is in prospect, but scarcity of material for delivery before the third quarter of next year is interfering with proposed building prospects. Local makers have advanced prices on bar iron to from 1.60c. to 1.70c. at mill. Makers of hard steel have advanced prices $2 a ton to 1.50c. for bars in carload lots and 1.60c. for angles. The demand for sheets continues heavy and some mills are asking $5 a ton on black and $4 a ton on galvanized above regular market prices.

Pig Iron.—The local market is quieter than it has been for several weeks. Some small lot sales of foundry grades are reported but there are no inquiries for lots of any size. Most consumers are covered for their first half requirements and a number who have not already bought are not expected to do so before the first of the year. One local furnace sold for out of town shipment for $17, furnace, for No. 2, which is 50c. lower than the general quotation. The sale of a small lot of 3 per cent. silicon is reported at $18 for prompt shipment. The market is generally firm and some makers are so well filled up for the first half that they do not care to take on additional business at present. Demand from consumers is heavy and shipments are delayed, partly due to car scarcity. Foundries generally are being operated at maximum capacity. There is practically no inquiry for Southern grades, which are being offered at $14 to $15, Birmingham, for the first half. Some Southern iron can be had at $13.50 for early delivery. For prompt shipment and for the first half of 1913 we quote, delivered Cleveland, as follows:

Bessemer	$18.15 to $18.40
Basic	17.40
Northern No. 2 foundry	17.50 to 18.00
Southern No. 2 foundry	18.35 to 18.60
Gray forge	17.00 to 17.25
Jackson County silvery, 8 per cent. silicon	20.55 to 21.55

Coke.—A number of contracts for foundry grades for the first half were placed at $4 per net ton at oven for standard 72-hr. Connellsville coke. For spot shipment foundry coke is quoted at $4.50 to $4.75. We quote standard furnace coke for prompt shipment at $3.85 to $4 and for contract, $3 to $3.25.

Old Material.—Weakness in the scrap market continues. There is very little inquiry and that is mostly for delivery after the first of the year, for which mills are offering at least 50c. a ton less than recent quotations. Dealers are busy making shipments on contracts but mills appear to have all the scrap under contract that they will need for several weeks and little activity is expected during the remainder of the year. Considerable scrap is being offered to yard dealers, who are not disposed to add to their stock. Heavy steel is now quoted at $13.50 to $14, local mills not offering more than the minimum quotation. While other prices have not been changed some concessions will be made from nominal quotations if such concessions would bring business. We quote, f.o.b. Cleveland, as follows:

Per Gross Ton.

Old steel rails, rerolling	$15.00 to $15.50
Old iron rails	17.50 to 18.00
Steel car axles	18.75 to 19.25
Heavy melting steel	13.50 to 14.00
Old car wheels	13.50 to 14.00
Relaying rails, 50 lb. and over	23.00 to 23.50
Agricultural malleable	12.50 to 13.00
Railroad malleable	14.00 to 14.50
Light bundled sheet scrap	12.50 to 13.00

Per Net Ton.

Iron car axles	$21.00 to $22.00
Cast borings	8.25 to 8.50
Iron and steel turnings and drillings	9.00 to 9.25
Steel axle turnings	9.25 to 9.50
No. 1 busheling	12.00 to 12.50
No. 1 railroad wrought	14.00 to 14.50
No. 1 cast	13.00 to 13.50
Stove plate	10.00 to 10.50
Bundled tin scrap	11.00 to 11.50

New York

NEW YORK, November 27, 1912.

Iron Ore.—The fixing of Lake Superior iron ore prices has led to some activity in Eastern ores. While no announcement has been made by the leading sellers in this district, it is expected that Port Henry ores, of which considerable reservations have already been made, will sell about 50 cents above the basis of this year, bringing them to substantially the prices of 1911. These ores, of which about 1,000,000 tons are mined, will thus sell at delivered prices, in Eastern Pennsylvania, of 8 to 8½ cents a unit. Earlier sales of 1913 ores from other Eastern properties were made in one case, at least, at but a small advance over the basis for 1912.

Pig Iron.—In the Metropolitan district the market has not been active, but buying in Western New York and in Canada has brought large orders to some of the furnaces at Buffalo. One interest in that district, however, is out of the market for an indefinite time. The tightness in coke is such that two furnaces there, which have been ready to blow in for some time, are still idle, and there is little prospect of their early resumption. Malleable pig iron made up a large part of the business done in the past week at Buffalo through New York offices, one lot of 20,000 tons being included in the total. This was placed by a Canadian plant. There was also a considerable sale of basic and foundry iron for Western New York and Canadian delivery. Buffalo prices for malleable and No. 2 X foundry iron, for delivery in 1913, have ranged from $17.50 to $18, several fair transactions being reported at the latter price. There is a considerable range in Buffalo prices, however, and No. 2, according to delivery, may be quoted from $17 to $18. In New England an inquiry for basic iron has come out, representing 5000 tons or more. Eastern Pennsylvania furnaces have done only a moderate business for shipment to tidewater districts. Their asking price in some cases has been as high as $18 at furnace for No. 2 X. The ore situation has not been a factor in the pig iron market except to stiffen prices. We quote as follows for Northern iron at tidewater: No. 1 foundry, $18.50 to $18.75; No. 2 X, $18.25 to $18.50; No. 2 plain, $17.75 to $18. Southern iron is quoted at $18.75 to $19 for No. 1 foundry and $18.50 to $18.75 for No. 2.

Structural Material.—A contract for 1600 tons for the addition to the Rhinelander building, 226 William street, given to Milliken Brothers, is the largest award which has come to light this week. There is nevertheless considerable activity in building work and even in railroad lines, and that there is belief in a continuance of good demand in business in general is indicated by a pressing demand by a number of railroads for early shipment in quantity of repair parts for cars. Some of the newer structural movements developing include 850 tons for the Weidner memorial library, Harvard; 400 tons for 4 bridges for the Boston & Maine, which is also to buy 350 tons for platform canopies for the Lynn station; 1150 tons for the Stewart department store in Baltimore, 2000 tons for three areas for the New York Central and 2500 tons for the Consolidated Gas Company, New York. The awards include: 400 tons for the New York & Long Branch at Morgan, N. J.; 325 tons for the American Smelting & Refining Company at Baltimore and 250 tons for an apartment on West Sixty-seventh street, to Levering & Garrigues Company. We quote plain material at 1.66c. to 1.86c., New York, for mill shipment, according to delivery and 2.15c. from store.

Steel Plates.—Local demand continues dull, as it has for the last few weeks, and the cessation in railroad car buying noted last week still obtains. Contradictory conditions exist with regard to forecasting activity next year. Against a number of railroad companies' vigorously buying repair parts for cars, to provide rolling stock to handle expected business, is the attitude of the president of one of the leading railroad systems, who thinks it wise to wait until the early part of next year before buying, although the required appropriation is now available. The Brazil Railway is in the market for 800 cars and it is expected that the Harriman Lines will buy 8000 cars this year; the International & Great Northern 1000 cars in the early part of 1913, and the Brooklyn Rapid Transit Company 800 steel cars when operating contracts for its subway are signed. The Canadian Pacific has closed with the Canadian Car & Foundry for 600 ballast cars and the New York, Philadelphia & Norfolk for 800 box cars with the American Car & Foundry Company and 50 cars with the Ralston Steel Car Company. Deliveries on plates are made in five to six weeks. Plates for prompt shipment, say for two weeks, command warehouse prices, such as 2c. and upward, New York; sheared plates are 1.76c., and universal plates 1.81c., New York, in six to eight weeks, and 1.66c. to 1.71c., New York, for future delivery.

Iron and Steel Bars.—Specifications on contracts show no reduction in demand and in bar iron products demand has if anything increased, especially in bar iron. Numerous inquiries for material for delivery beyond the first half have been received and one company has made an advance of $2 a ton for new business for 1913, making the price 1.80c., New York, in carloads. Steel bars are still nominally 1.40c., Pittsburgh, or 1.56c. minimum, New York, mill shipments, and from store 2c. Refined iron bars are 1.70c. to 1.80c., New York, and for store, 2c.

Cast Iron Pipe.—The season is now here when little buying is expected, and therefore the pipe manufac-

turers are not greatly disappointed because business has fallen off. The only public letting of any importance in sight is that of New Bedford, Mass., calling for 630 tons of 4 to 16 in., on which bids will be opened December 4. Considerable inquiry is in hand for next year. The higher prices named for pig iron are causing pipe manufacturers to name higher quotations. Some ask a minimum of $26 per net ton at tidewater for carload lots of 6 in., while others quote from $24.50 to $25.

Old Material.—The movement of steel scrap to buyers' yards has been so heavy that one of the largest steel companies in eastern Pennsylvania has been embargoed, while almost all the other companies are so well supplied that they will only take additional quantities at concessions. The bar iron mills also appear to be well stocked and few of them are willing to make further purchases. Dealers also have large stocks. The tendency of the market is therefore downward, as it will take some time to work off present accumulations even if no additional supplies were to come on the market. A conspicuous exception to the general quietness is observed among the foundries, which are buying cast scrap quite freely and some who have contracts are urging dealers to make more rapid shipments. Old car wheels and other grades of cast scrap, with the exception of locomotive grate bars, are firm. Dealers' quotations are as follows, per gross ton, New York and vicinity:

Old girder and T rails for melting	$12.00 to $12.50
Heavy melting steel scrap	12.00 to 12.50
Relaying rails	22.50 to 23.00
Rerolling rails	14.00 to 14.50
Iron car axles	24.00 to 25.00
Old steel car axles	16.50 to 17.00
No. 1 railroad wrought	14.00 to 14.50
Wrought iron track scrap	13.00 to 13.50
No. 1 yard wrought, long	12.50 to 13.00
No. 1 yard wrought, short	12.00 to 12.50
Light iron	5.50 to 6.00
Cast borings	8.75 to 9.25
Wrought turnings	9.25 to 9.75
Wrought pipe	11.00 to 11.50
Old car wheels	15.00 to 16.00
No. 1 heavy cast, broken up	12.00 to 12.50
Stove plate	9.75 to 10.00
Locomotive grate bars	9.00 to 9.50
Malleable cast	11.50 to 12.00

Ferroalloys.—A goodly tonnage of 80 per cent. ferromanganese is reported as having been placed for delivery in the last half of next year at $61, Baltimore. Spot is quoted firm at $75, an offer of $73 having been declined on Tuesday. For first half delivery quotations are $65 and higher. The scarcity, which is credited to heavy consumption here and abroad, is acute for first half delivery as well as spot, and sellers are few. The United States Steel Corporation has placed contracts for approximately 8000 tons of ferrosilicon for 1913 delivery, also for about 1800 tons of ferrochrome. The largest producer is said to have got all the business in both alloys; in fact, it is the only manufacturer that could undertake such large contracts. Ferrosilicon quotations for 50 per cent. are unchanged at $75, Pittsburgh, for carloads; $74 for 100 tons, and $73 for 600 tons or over.

Metal Market

NEW YORK, November 27, 1912.

The Week's Prices

Cents Per Pound for Early Delivery.

	Copper, New York.			Lead		Spelter	
Nov.	Lake.	Electrolytic.	Tin, New York.	New York.	St. Louis.	New York.	St. Louis.
21	17.75	17.62½	49.60	4.50	4.35	7.50	7.35
22	17.75	17.62½	49.60	4.50	4.35	7.50	7.35
23	17.75	17.62½	.....	4.50	4.35	7.50	7.35
25	17.75	17.62½	49.45	4.50	4.35	7.50	7.35
26	17.75	17.62½	49.65	4.50	4.35	7.50	7.35
27	17.75	17.62½	49.55	4.50	4.35	7.50	7.35

Copper is dull but steady. Tin is quieter after an excellent buying movement. Lead is lower and unsettled. Spelter is unchanged. Antimony is dull and weaker.

New York

Copper.—The market has been dull but steady. Foreign demand in the last few days has been as quiet as the domestic, there having been as yet no resumption of the excellent buying for export which was started about the middle of November, but which subsided abruptly following a renewal of fears that the Balkan war would involve nations not now engaged. The exports of copper this month total only 14,935 tons, the smallest for a corresponding period of time in over two years, and which, of course, shows a corresponding falling off in buying for Europe at some time heretofore. Domestic consumption has continued unusually good, but inasmuch as consumers were amply covered for November they have so far been enabled to stay out of the market. They are not so well provided for in the matter of December needs, and greater purchasing activity is anticipated, and this, it is thought, will be shared by foreign consumers. Lake is nominally quoted at 17.75c., cash, New York, and electrolytic at 17.62½c., cash, New York, although these prices undoubtedly could be shaded for prompt delivery metal and January and February could probably be had at 17.50c., cash, New York, from second hands. The price of spot copper in London to-day is £77 3s. 9d. and futures £77 15s.

Pig Tin.—The latter part of last week brought an excellent buying movement in tin, particularly for January, February, March and April deliveries, while the inquiry for and taking of spot were also improved. The interest in futures started November 21 and culminated the day following in an activity that the market had not seen before for some time and at least 600 tons was bought on that day, the bulk of it for delivery in February. There was an additional demand which held over to Saturday, but in the absence of sellers not much was done that day, although on Monday there was a fair business. It has been expected that higher prices would prevail on Monday, but war talk in London had a bad effect on that market, which was reflected here in lower prices. The result was a loss of confidence, and while there since has been some further inquiry for futures there has been little new business. Yesterday the market was extremely quiet. The price of both spot and futures in London to-day is £226 5s. and the price in New York is 49.55c. The arrivals this month total 3251 tons and there is afloat 815 tons. For the month about 5100 tons will be available for deliveries, but it is estimated that deliveries will be between 3700 and 4000 tons.

Tin Plates.—The market is quiet so far as large business is concerned, although a fair jobbing demand continues.

Lead.—The free offering and much competition in lead resulted in a reduction of the price to 4.50c., New York, on Thursday last by the American Smelting & Refining Company. With the new and lower price there is still an unsettled feeling and the dullness of the season and the pressure to sell, particularly by those outside of the largest interest, may lead to a still further reduction. Lead is quoted in New York at 4.50c. and 4.35c. St. Louis.

Spelter.—This metal is unchanged as to price and is dull. Galvanizers and brass mills are still consuming spelter freely, the cost of which was probably higher than prevails at present. It is not felt that prices will fall much below their present level, inasmuch as the cold weather, which means difficulties in production, is approaching. The price in New York is 7.50c. and in St. Louis 7.35c.

Antimony.—While the import prices of antimony are unchanged at 10.50c. for Cookson's, 9.87½c. for Hallett's and 9.50c. for Hungarian and Chinese grades, there has been an easing off in the prices asked for resale lots, and while the market is quiet the weaker prices have stimulated a trifle more trade. Quotations are rather uncertain, and the prices of a week ago could probably be shaded 12½c. to 25c. per 100 lb. They are: Cookson's, 10.37½c.; Hallett's, 9.75c. and Hungarian and Chinese grades 9.37½c.

Old Metals.—The market is dull. Dealers' selling prices are nominally unchanged as follows:

	Cents per lb.
Copper, heavy and crucible	17.00 to 17.25
Copper, heavy and wire	16.50 to 16.75
Copper, light and bottoms	15.00 to 15.25
Brass, heavy	10.50 to 10.75
Brass, light	8.50 to 8.75
Heavy machine composition	14.00 to 14.25
Clean brass turnings	9.75 to 10.00
Composition turnings	12.50 to 13.00
Lead, heavy	4.75
Lead, tea	4.50
Zinc, scrap	6.25

Chicago

NOVEMBER 26.—Quotations for lead are decidedly soft and interest in this metal is almost entirely lacking. Prices for casting copper are slightly lower. Although fluctuating to both higher and lower levels, current tin quotations are about as a week ago. We quote as follows: Casting copper, 17.62½c.; Lake, 17.87½c. to 18c., in carloads for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, carloads, 50.75c.; small lots, 53c.; lead, desilverized, 4.45c. for 50-ton lots; corroding, 4.70c. for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 7.40c. to 7.50c.; Cookson's antimony, 11.25c., and other grades, 10.50c. in small lots; sheet zinc is $9, f.o.b. La Salle or Peru, Ill., less 8 per cent. discount in carloads of 600-lb. casks. On old metals we quote buying prices for less than carload lots: Copper wire, crucible shapes, 15.50c.; copper bottoms, 14c.; copper clips,

15c.; red brass, 12.75c.; yellow brass, 10c.; lead pipe, 4c.; zinc, 5.50c.; pewter, No. 1, 33c.; tinfoil, 39c.; block tin pipe, 45c.

St. Louis

NOVEMBER 25.—The week has been rather quiet, with a decline in lead the only material change in quotations. Lead closed to-day at 4.25c.; spelter, 7.35c.; tin, 49.60c. to 50.10c.; Lake copper, 17.97½c. to 18.22½c.; electrolytic copper, 17.87½c. to 18.12½c.; Cookson's antimony, 10.85c. In the Joplin market zinc ore was in much stronger demand and the top settlement was made at $61 per ton, with the basis range from $55 to $58 for 60 per cent. The demand continues strong for calamine at $29 to $32 on the assay basis of 40 per cent., while the choicest grades brought as high as $37. In lead ore there was a weakening tendency, with the price for 80 per cent. at $56, a drop of $1. In general, however, the business of the week was heavy and the production is being kept up to the top quantity against the time when the weather will interfere with the output. We quote miscellaneous scrap metals as follows: Light brass, 6.50c.; heavy brass and light copper, 10.50c.; heavy copper and copper wire, 13c.; pewter, 25c.; tinfoil, 32c.; zinc, 4.50c.; lead, 4c.; tea lead, 3c.

Iron and Industrial Stocks

NEW YORK, November 27, 1912.

The stock market advanced quite sharply on Thursday and Friday, under the stimulus of good trade reports and reassuring news from Europe, but subsequently receded as the outlook for peace among the great European nations became somewhat clouded. Domestic influences have been somewhat eclipsed by the European situation, which threatens financial complications. The range of values on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Bald. Loco., com...	56 - 56½	Pressed Steel, com..	35⅝- 38
Bald. Loco., pref...	106⅞-107⅛	Pressed Steel, pref..	101¼-101⅜
Beth. Steel, com....	39 - 41¼	Railway Spring, com.	37 - 37¾
Beth. Steel, pref...	68½- 71	Republic, com.....	26¼- 28⅛
Can, com.....	40⅛- 43¼	Republic, pref.....	88½- 90
Can, pref.....	122½-124½	Sloss, com.....	50
Car & Fdry., com..	59¼- 60¼	Sloss, pref.....	94 - 95½
Car & Fdry. pref...	119¼-119⅜	Pipe, com.....	19 - 19⅝
Steel Foundries.....	36¼- 38	U. S. Steel, com...	73½- 76
Colorado Fuel.....	34¾- 37	U. S. Steel, pref...	111 -112⅜
General Electric....	182¼-185¼	Westinghouse Elec..	80½- 82½
Gr. N. Ore. Cert...	44½- 47⅛	Am. Ship, com.....	57 - 58½
Int. Harv., com....	119½-121¼	Chic. Pneu. Tool...	53 - 53¾
Int. Harv., pref....	113½-115½	Cambria Steel	48¾- 49¾
Int. Pump, com....	26 - 26½	Lake Sup. Corp....	30½- 31½
Lackawanna Steel...	49 - 51	Pa. Steel, pref.....	95
Locomotive, com....	45½- 47⅜	Warwick	10¼
Locomotive, pref....	106¼-107¼	Crucible Steel, com.	16⅛- 16½
Nat. En. & St., com.	19⅝- 21⅛	Crucible Steel, pref.	93½- 96½
Pittsburgh St., pref.	100 -100¾	Harb. Walk, Ref., pref....	103

Dividends Declared

The New York Air Brake Company, quarterly, 1½ per cent., payable December 16. Last previous declaration was in June, 1911, 1½ per cent.

The National Lead Company, regular quarterly, three-fourths of 1 per cent. on the common stock, payable December 31.

The J. A. Fay & Egan Company, regular quarterly, 1¾ per cent. on the preferred stock.

The LaBelle Iron Works, quarterly, 2 per cent. on the new preferred stock, payable December 23, and one-half of 1 per cent. on the common stock, payable January 31.

The Crucible Steel Company of America, regular quarterly, 1¾ per cent. on the preferred stock, payable December 24.

The William Tod Company, Youngstown, Ohio, is furnishing to the Republic Iron & Steel Company one 30 x 36 in. and one 28 x 30 in. horizontal piston valve automatic engines. They will be used for driving the new finishing mills now being erected to replace some former mills in the Brown-Bonnell works.

The European production of sugar in the season of 1911-12 is stated to have been 6,346,000 metric tons (2204.6 lb.), compared with 8,105,126 tons in 1910-11. It is produced wholly from beets. Germany is the leading producer, Russia comes second, Austria is third and France is fourth.

The Harley Company has succeeded the Millett & Harley Company, brass castings, Springfield, Mass.

Judicial Decisions of Interest to Manufacturers

ABSTRACTED BY A. L. H. STREET

WHEN FOREIGN CORPORATION'S CONTRACTS ARE VOID.—Missouri contracts of a foreign corporation, which has not been licensed to do business in the State, are void and cannot be validated by subsequently procuring a license. If a note is partly given under such an agreement, it is wholly void, though part of the consideration be valid. (Missouri Supreme Court, Parke, Davis & Co. vs. Mullett, 149 Southwestern Reporter 461.)

EFFECT OF PAYMENT ON RIGHTS UNDER CONTRACT OF SALE.—If a buyer still owes the full contract price of goods, the seller's acceptance of a check for part of the amount, reciting that it is tendered as full payment, does not prevent the seller from suing for the balance. Nor does a buyer waive his right to claim damages for a delay in delivery, by accepting the goods and paying the full agreed price. (New York Supreme Court, Erie County Trial Term, Kleinfelter vs. Granger, 136 New York Supplement 485.)

WARRANTY OF SECOND-HAND MACHINERY.—Ordinarily, a sale of second-hand machinery does not imply a warranty of its condition. An express warranty that such machinery is in "first class condition" must be construed with regard to the fact that the machinery is second-hand. (Arkansas Supreme Court, Yellow Jacket Mining Company vs. Tegarden Brothers, 149 Southwestern Reporter 518.)

CARRIER'S LIABILITY FOR DELAY IN TRANSPORTATION.—A railroad company, not having been advised that freight shipped was intended for sale at the destination at a certain time, is not liable for a delay in transportation, for the consequential damages of loss of profits from such sale. (St. Louis Court of Appeals, Dunne & Grace vs. St. Louis & Southern Railway Company, 148 Southeastern Reporter 997.)

RESPONSIBILITY FOR ONE WORKMAN'S NEGLIGENCE TOWARD ANOTHER.—Where the "fellow servant doctrine' is in force in a State, an employer is not liable for injury to an employee caused by a fellow workman if the employer used reasonable care in selecting and retaining the negligent workman. A single act of negligence on the part of an employee is ordinarily insufficient to charge his employer with knowledge of his incompetency within this rule. (Delaware Superior Court, Warren vs. Harlan & Hollingsworth Corporation, 84 Atlantic Reporter, 215.)

INJURY INDIRECTLY CAUSED BY DEFECTIVE LIGHT.—A foundry workman can recover for injury sustained through the falling of an arbor, caused by the sudden going out of an electric light, the burning of which was essential to safe performance of his work, if the light had previously proved to be unreliable to the employer's knowledge, actual or constructive. (Alabama Court of Appeals, Frederick vs. Coosa Pipe & Foundry Company, 59 Southern Reporter 702.)

LIABILITY UNDER EMPLOYER'S INDEMNITY POLICY.—An employer's liability indemnity insurance company does not waive the right to deny liability under a policy by undertaking defense of a suit brought by an injured workman, where it is expressly agreed that there is "full reservation of policy rights" by the company. (New York Supreme Court, Erie County Trial Term, Buffalo Steel Company vs. Aetna Life Insurance Company, 136 New York Supplement 977.)

WHEN EMPLOYMENT CONTRACTS MUST BE IN WRITING.—A contract of employment for one year or more is required by law to be in writing, but the employee under an oral agreement will not be prevented from recovering a balance due him if he has fully performed the agreement on his part and the employer has paid part of the agreed compensation. (Arizona Supreme Court, Diamond vs. Jacquith, 125 Pacific Reporter 712.)

CONTRIBUTORY NEGLIGENCE IN OILING MACHINERY.—A workman cannot recover for injuries received while oiling machinery near moving cogwheels, the danger being obvious. (United States Circuit Court of Appeals, Third Circuit, Schwartzmuller vs. Warden Mackey Company, 197 Federal Reporter 38.)

WHEN EMPLOYER IS NOT LIABLE FOR NEGLIGENT INJURY.—A workman employed to perform a particular kind of work cannot recover for injury received while voluntarily doing another man's work. He can recover, however, for injury received through his employer's negligence while going for a drink of water, or to a toilet, or to his meals, because such acts are within the contemplation of the parties to every employment contract. (Alabama Court of Appeals, Sloss-Sheffield Steel & Iron Company vs. Moore, 59 Southern Reporter 311.)

Personal

E. P. Bullard, Jr., president Bullard Machine Tool Company, Bridgeport, Conn., delivered an address on Tuesday evening, November 26, before the Cleveland Engineering Society, Cleveland, Ohio, on "A New Era in Machine Design," in which he covered the basic principles of the design and construction of machines which will fully meet the new requirements of present-day manufacture.

E. W. Strong, formerly with the American Locomotive Company, New York City, is now manager of publicity for the American Vanadium Company and the Vanadium Sales Company, Pittsburgh.

Samuel G. Neiler and Edward P. Rich, herefore conducting a general engineering business under the corporation name of Pierce, Richardson & Neiler, have changed the corporate name to that of Neiler, Rich & Co., with headquarters in the Manhattan Building, Chicago.

C. G. Roulette, general manager of the Chester plant of the American Sheet & Tin Plate Company, has resigned, effective December 1. He has not yet decided on a new connection.

John Stephens, for the past seven years superintendent of the plant of the Parkersburg Iron & Steel Company, Parkersburg, W. Va., has retired, expecting to remove to his former home at Indiana Harbor, Ind., to enjoy a long rest. He has been in the steel business for 54 years, and for 34 years of that time has been acting as superintendent of various plants.

E. E. Slick, who recently resigned his position as chief engineer of the Carnegie Steel Company, at Pittsburgh, to become general manager of the Cambria Steel Company, Johnstown, Pa., has been presented by Carnegie officials with a diamond studded gold watch, chain and charm.

W. E. Hartman, managing engineer of the H. Koppers Company, Chicago, has tendered his resignation, effective November 25. The following are the present officers of the company: H. Koppers, president; J. C. McMath, vice-president and general manager; Thomas V. Salt, second vice-president; Allan Strale, chief engineer, and Joseph M. Butler, secretary and treasurer.

E. P. Williams, superintendent of the foundry blast furnaces of the Tennessee Coal, Iron & Railroad Company, Birmingham, Ala., has resigned his position.

Archibald Johnston, vice-president of the Bethlehem Steel Company, returned last week from a stay of several months in Europe and South America. In Chili he negotiated a contract for heavy coast defense guns, which will be built at South Bethlehem in the next 18 months.

Norman B. Chace, general superintendent Cincinnati Shaper Company, expects to leave in a few days for an extended business trip to Europe.

William T. Price, De la Vergne Machine Company, New York, will read a paper on "Oil Engines of the Internal Combustion Type" before the Philadelphia Foundrymen's Association on Wednesday evening, December 4.

Carl E. Swoboda, formerly connected with the Girard Machine Tool Company, Philadelphia, Pa., is now associated with Herman L. Winterer, second-hand machinery merchant, 908 Beach street.

A. W. Boyd, who recently resigned as traveling freight agent of the Lake Shore & Michigan Southern Railroad, has been made traffic manager of the Union Drawn Steel Company, Beaver Falls, Pa.

Walter Wood, of R. D. Wood & Co., Philadelphia, is making a trip to Cuba.

H. Koppers, president H. Koppers Company, by-product coke oven builder, will sail for Bremen, Germany, on the George Washington, November 30.

The directors of the Crucible Steel Company of America have re-elected the officers and have established the office of fourth vice-president, naming H. A. Brown for that position. He has been the assistant general sales agent of the company at New York, where he will continue to make his headquarters as fourth vice-president. The following appointments were also made: Reuben Michener, formerly assistant general sales agent at Pittsburgh, was promoted to the vacant position of general sales agent, with headquarters at Pittsburgh. W. D. Wintersmith, formerly sales manager of the railroad spring department, was promoted to the position of assistant general sales agent, with headquarters at Pittsburgh. C. F. Blue, Jr., formerly manager of the Detroit branch, was promoted to the newly-created position of assistant general sales agent for the West, with headquarters at Chicago, Ill.

Fred E. Bright is the new president of the Hess-Bright Mfg. Company, Front street and Erie avenue, Philadelphia, Pa. He has always held the controlling interest in the company but has not hitherto been active in the management. The new secretary is A. T. Bruegel and the new treasurer is C. L. McCalla.

Robert Bacon has been elected a director of the United States Steel Corporation to succeed the late C. A. Griscom.

Obituary

ISAAC P. LAMSON, president Lamson & Sessions Company, bolt, nut and rivet manufacturer, Cleveland, Ohio, died November 20, from hardening of the arteries, after a month's illness. He was 80 years old, having been born in Mt. Washington, Mass., in 1832. He was employed for a number of years in bolt factories in Southington, Plantville and Milldale, Conn. In 1868 he joined his brother, H. L. Lamson, and Thomas S. Sessions in establishing the Lamson & Sessions Company at Mt. Carmel, Conn. The following year the business was removed to Cleveland. Mr. Lamson was a director of the Ferry Cap & Set Screw Company, the Union Rolling Mill Company, and the Union National Bank, Cleveland. He also took an active interest in civic, philanthropic and political affairs in Cleveland.

ARTHUR C. SCOTT, representative in Great Britain of the Norton Company, Worcester, Mass., died suddenly in London, November 22, aged 42 years. He was born in Northbridge, Mass., and moved to Worcester when a boy. Having spent two years in a railroad office, he went with the Draper Machine Tool Company, where he remained until 10 years ago, when he entered the employ of the Norton Company as a salesman. Three years ago the Norton Company made him its representative in Great Britain, with headquarters in London. He leaves a widow.

ELIJAH J. LYON, Providence, R. I., formerly superintendent of the foundry of the Brown & Sharpe Mfg. Company, died November 22, aged 69 years. Born in Worcester, he was educated at Dudley Academy, and learned the trade of machinist at Providence. In 1857 he entered the employ of Brown & Sharpe as a machinist, and later became head of the foundry. He was the oldest employee of the company in point of service. He leaves a widow.

HOWARD JAMES, vice-president and director of purchases of the Great Northern Railroad, and Samuel B. Plechner, purchasing agent, were killed at St. Paul, November 24 by the overturning of the automobile in which they were driving with their families. Both were widely known in iron and steel circles.

J. D. ROLLAND, head of the Rolland Paper Company, Montreal, president of the Hochelaga Bank, member of the Quebec Legislative Council, ex-president of the Canadian Manufacturers' Association, director of the Manufacturers' Life Insurance Company, Governor of Laval, etc., died suddenly November 23.

EDWIN F. BEDELL, formerly connected with Cooper, Hewitt & Co., died November 21 at his home in Montclair, N. J., aged 76 years. He leaves a widow, two sons and three daughters.

The Richmond Radiator Company, New York, has been incorporated under Delaware laws, with a capital stock of $4,725,000, of which $1,575,000 is preferred. The new company has been formed to take over the business, which has been in the hands of receivers, of the McCrum-Howell Company, manufacturer of cast-iron heating boilers, radiators and vacuum cleaning apparatus. It will maintain offices and show rooms in the new Longacre Building, 1480 Broadway and will continue the manufacture of the products of the McCrum-Howell Company under the new trade name of Richmond. The officers of the company are: F. H. Moore, president; P. H. Seward, vice-president, and W. M. Hoagland, secretary-treasurer.

Pittsburgh and Vicinity Business Notes

The Blaw Steel Construction Company, Pittsburgh, manufacturer of steel forms for concrete construction, now building a new plant at Hoboken, Pa., has bought 12 acres more to provide room for future extensions and also for the purpose of building a number of houses for its workmen. The company expects to have its new plant completed in January, and is now booking orders so freely that the factory will probably be run through next year to full capacity. Among other equipment in this plant will be a gas-fired 8 x 4-ft. plate heating furnace and five rivet heating furnaces designed and constructed by Tate-Jones & Co., Inc., Pittsburgh.

The Isthmian Canal Commission, after careful investigation, has awarded to the American Cement Tile Mfg. Company, Oliver Building, Pittsburgh, Pa., a contract for Bonanza reinforced cement tile for the roof coverings of the new Balboa shop buildings on the Pacific side of the isthmus. These shops, which are among the largest in the world, occupy 16 buildings in all, requiring approximately 650,000 sq. ft. of the tile. The American Cement Tile Mfg. Company will establish a plant on the isthmus, manufacturing under Government inspection.

The Petroleum Iron Works Company, Sharon, Pa., steel plate construction, is building a two-story brick addition, 20 x 52 ft., to its office building.

The new plant of the Pressed Steel Products Company at Sharon, Pa., is nearing completion, and is expected to be in operation soon after January 1.

The Duquesne Steel Foundry Company, Pittsburgh, is installing a 5-ton Case electric crane, equipped with Westinghouse motors, in its shops at Kennerdell, near Pittsburgh.

The Thomas Carlin's Sons Company, 1600 River avenue, Pittsburgh, recently shipped a No. 2 shear, to cut up to 5 x 5 in. square soft steel cold, to the Sofranscy Company, Allentown, Pa.; a No. 18 shear, to cut up to 2¼ in. steel, to Edward McMullin, Washington, D. C., and a No. 18 each to the Berwind White Coal Mining Company and the Muskingum Iron & Metal Company. A 9-ft. self-discharging grinding pan shipped to the Buckeye Steel Casting Company, Columbus, Ohio, makes six of these machines now in use at that plant, while an order is in hand for three additional pans. An order for a 5-ft. pan has been received from the Pittsburgh Iron & Steel Foundries Company and an order from the Youngstown Sheet & Tube Company for a 7-ft. pan and a Blake crusher. A No. 3 shear, with motor, is being built for the Chicago, Burlington & Quincy Railroad. Orders have been booked for quite a number of hoists, derricks and other contractors' machinery.

The Green Engineering Company, Oliver Building, Pittsburgh, has installed chain grate stokers in the power plant of the Carbon Steel Company, Pittsburgh, to operate eight 250-hp. Mosher boilers and one 500-hp. Rust boiler. The installation displaces a number of hand fired boilers, decreasing the cost of power production and the amount of smoke. The Green Company has also installed chain grate stokers to operate nine 600-hp. Stirling boilers in the power plant of the Pittsburgh Crucible Steel Company, at Midland, Pa.

The United Engineering & Foundry Company, Pittsburgh, is making the plans for the new hot and cold-rolled strip steel plant to be erected by the Weirton Steel Company, Weirton, W. Va., and will shortly take bids on the equipment. The contract for the steel has already been placed with the McClintic-Marshall Construction Company, Pittsburgh. The buildings are to be of steel and corrugated iron construction, and will require approximately 600 tons. The mill building will be 200 x 300 ft.; annealing building, 50 x 150 ft.; pickling building, 50 x 150 ft.; machine shop, 40 x 60 ft., and gas producer plant, 40 x 70 ft.

The Amsler Engineering Company, Wabash Building, Pittsburgh, has completed the installation of two 9-ft. gas producers for the Braeburn Steel Company, Braeburn, Pa., and has a contract for five 11-ft. producers, complete, with 24-in. gas and 36-in. air combination reversing valves, for the American Plate Glass Company, Kane, Pa.

The McClintic-Marshall Construction Company has a contract for a 40 x 60-ft. extension to the main building of the Superior Steel Company, Carnegie, Pa., and a 100-ft. crane runway with a 90-ft. span; also a contract for a 144 x 160-ft. addition to the works of the Pittsburgh Valve & Fittings Company, Barberton, Ohio.

The Carnegie Steel Company is adding to one of its Pittsburgh power plants a 3000-kw. Curtis condensing turbo-generator with 35-kw. non-condensing turbo-exciter and switchboard apparatus. The General Electric Company is supplying the unit and making the installation.

The West Penn Traction & Water Power Company, Pittsburgh, has completed arrangements for the equipment of its new 40,000-kw. hydroelectric plant, the first of a series of developments on the Cheat River, at the Pennsylvania-West Virginia line. The electrical apparatus includes four 10,000-kw Allis-Chalmers vertical water wheel type alternators, two 300-kw motor-generator exciter sets and accessories of the same company's design. The territory to be served by this system encircles the Pittsburgh industrial district, and current will be furnished for the electrical operation of coal mines and manufacturing plants. This system extends as far as Derry on the east; Kittanning and Butler on the north; Aliquippa, Ambridge and Wheeling on the west, and Waynesburg, Uniontown and Connellsville on the south. It involves 259 miles of 110-000-volt lines.

The S. R. Smythe Company, House Building, Pittsburgh, has received an order from the Andrews Steel Company, Newport, Ky., for the building of a 60-ton open hearth furnace with all necessary equipment.

The Pittsburgh Steel Company has applied for a charter for the Monessen & Southern Railroad Company, which will construct a three-mile railroad from the Monessen plant of the steel company to Charleroi, on the opposite side of the Monongahela River, connecting the plant with the company's coal and coke properties.

The Mesta Machine Company, Pittsburgh, has received an order from the Youngstown Sheet & Tube Company, Youngstown, Ohio, for a 108-in. barometric condenser; an order from the Carnegie Steel Company, for a 57-in. barometric condenser to be installed in its McCutcheon mills, Pittsburgh, and an order from the Bethlehem Steel Company, South Bethlehem, Pa., for a motor-driven shear to cut 2½ in. square.

The American Roller Bearing Company, Pittsburgh, has been organized. Edwin N. Ohl, is president; C. D. Scully, secretary and treasurer, and C. C. Leech, general manager. It will put on the market a new type of roller bearing in which no oil is used, the bearing being made of rolls with no sliding contact. A small plant has been fitted up in the Imperial Power Building, Pittsburgh, and very satisfactory tests have been made in different types of work. Roller bearings of this type have been in constant use in test work at the Pennsylvania Railroad shops at Olean, N. Y., and a Sturtevant blower has been operated for three and one-half years at 2200 r.p.m. with one of these bearings with most satisfactory results.

The Skinner Chuck Company, New Britain, Conn., has acquired the planer chuck business of the Francis Reed Company, Worcester, Mass., and has moved to its own plant the stock of finished chucks and patterns. The Francis Reed Company manufactures a line of improved drilling machinery and had made the Jordan planer chucks for upward of 20 years, but, wishing to concentrate its efforts on the manufacture of drills, disposed of its chuck business to the Skinner Chuck Company, already manufacturing a similar line of chucks, and growing very rapidly under its able management. The officers of this company are: President, David N. Camp; vice-president and treasurer, Daniel O. Rogers; secretary and assistant treasurer, Edward J. Skinner.

An English blast furnace company is reported to have placed a large contract for iron ore from the Briey district of the department of Meurthe-et-Moselle, France, in view of the satisfactory results with a trial shipment made some months ago.

The Wm. Cramp & Sons Ship & Engine Building Company, Philadelphia, Pa., on November 23 launched the United States torpedo boat destroyer No. 47, christened the Aylwin.

Recent Results with Electric Pig Iron

A Report on Operations at Trollhatten, Sweden—Some Changes Made

A second detailed report has been made to the Swedish Jernkontor by A. Leffler and E. Nystrom, covering the operation of the experimental plant at Trollhätten for electric smelting of iron ore, from August 4, 1911, to March 6, 1912. The following abstract is taken from Professor Neumann's review of this report given in a recent issue of Stahl und Eisen. The structural changes made in the furnace consisted, first, in the building of a proper wet purification plant for the gas, which has shown up well in practice. Then the electrodes have been changed from square to round in cross-section, and this has necessitated changes in the roof openings, water-cooling arrangements and the electrical connections. The connection between the shaft and the fusion chamber has been enlarged without changing the angle of the boshes. Opportunity was taken to thoroughly repair and reline the chamber and the boshes. In the course of this work an 18-ton sow was removed from the hearth.

The change from square to round electrodes has shown some advantage. They are 600 mm. (23.6 in.) dia., and 1.5 to 1.8 m. (59 to 71 in.) long. They are connected with nipples so that they can be used completely. The current enters the electrodes through half-circular copper contacts affixed just above the roof, so that the upper end of the electrodes is not heated, as in the case of the old square ones. Those now used give 4.15 per cent. ash, 0.022 per cent. phosphorus and 0.85 per cent. sulphur. The nipples show 3.72 per cent. ash, 0.011 per cent. phosphorus and 0.80 per cent. sulphur. The ash consists mainly of 44.70 per cent silica, 14.79 per cent. oxide of iron and 27.73 per cent. alumina.

The electrode consumption from August 4 to March 6 was on the average 5.72 kg. per metric ton of iron. With regular furnace operation and good material in the charge it should certainly be lowered to 5 kg. (11 lb.).

In the period covered by the report many different ore mixtures, with magnetic concentrates, were worked for different firms. The total and average figures were as follows:

Limestone used	380.922 metric tons
Ore smelted	5273.884 metric tons
Charcoal used	1300.998 metric tons
Coke used	4.700 metric tons
Electrode carbon	1.574 metric tons
Output iron	3214.180 metric tons
Slag output	1039.432 metric tons
Iron in ore	60.95 per cent.
Iron in charge	56.84 per cent.
Slag per ton iron	0.323 metric tons
Charcoal per ton iron	0.405 metric tons
Time furnace was in operation	4825 hours 44 min.
Time inactive	345 hours 11 min.
Voltage phase I	73.6 volts
Voltage phase II	76.8 volts
Current strength, phase I	11423 amperes
Current strength, phase II	11391 amperes
Average burden	1482 k.w.
K.w. hr.	7151668
K.w. hr. per ton iron	2225
Electrode consumption	5.72 kg. per ton

Analyses of Iron and Slag

The average analyses of the gases circulated was: CO_2 23.49 per cent., CO 63.15 per cent., H 10.35 per cent., CH_4 1.52 per cent. and N 1.49 per cent., and the heating value per cu.m. was 2297 cals. (258 B.t.u. per cu. ft.).

Several times in the course of the run the furnace had to be shut down for repairs. The chief cause was the roof, where bad places developed either between two electrodes or between an electrode and the shaft. At one time the whole roof had to be rebuilt. This took 77¾ hr., and afterward it was found that the charge had sintered in the shaft, so that everything had to be removed and the furnace recharged. The total loss in time was 123 hr. 10 min. The original Swedish report gives detailed analyses of 640 casts of iron and of 40 slags. These show that the carbon, sulphur and phosphorus do not vary greatly. The carbon usually ranges from 3.3 to 3.7 per cent., but it rises to 4.1 per cent. and sinks to 2.4 per cent. The last 100 analyses mostly show less than 3 per cent. carbon. The sulphur is usually less than 0.01 per cent., and is generally between 0.002 and 0.022 per cent. Only at the beginning and end of the run does the sulphur show higher, up to 0.05 per cent. The phosphorus is usually from 0.01 to 0.02 per cent; occasionally it is higher, or from 0.03 to 0.04 per cent.

The silicon and manganese are subject to considerable variations, especially the silicon. The manganese is usually under 0.5 per cent., but with the last charges it rises to 2.26 per cent. For over two months the silicon was low—from 0.1 to 0.5 per cent., only two casts rising to 0.75 per cent. On the other hand, at other times it was very high—up to 6.15 per cent. It seems evident, therefore, that the conditions are not yet altogether known whereby the silicon can be regularly maintained at a certain amount, say 1 to 1.5 per cent.

In regard to the slag, 34 determinations showed that the amount of shot metal was 1.09 per cent. The slag analyses vary greatly. Many of them contain TiO_2, and the degree of acidity when Al_2O_3 and TiO_2 are figured as acids varies from 1.30 to 2.09. Both CaO and MgO are used as bases, the former being usually in excess.

Many measurements were made of the tapping temperatures of the iron and slag. Those of the slag were usually from 30 to 90 deg. higher than those of the metal. The temperatures of the iron generally varied from 1290 to 1330 deg. C. In only one case was 1420 deg. reached.

The report closes with the details of many experiments regarding the use of fine magnetic concentrates. More than 30 per cent. cannot be used, and even this amount gives trouble if they are very fine grained. G. B. W.

Bridgeport Manufacturers' Dinner

The Bridgeport Manufacturers' Association, Bridgeport, Conn., is a live organization. A report of the monthly dinner on the evening of November 21, as given in the Bridgeport Telegram, states that no less than 360 persons were present. A list of the factories represented would comprise practically all of Bridgeport's industries of any importance. The attendance also meant more than mere numbers as it showed that the heads of the city's industries are keen enough to see the advantage of bringing their superintendents and foremen together with them for a good dinner and for association with their fellow-workers, thus receiving a mental jogging that undoubtedly has its effects to quicken their ability. As stated, there were great groups of family parties, some company tables having as many as 18 or 19, including the president, shop superintendent, foremen, sales respresentatives, advertising managers, etc.

James Harkness, president Jones & Lamson Machine Company, Springfield, Vt., was the speaker of the evening. His talk related to the human factor, with special relation to the element of habit, which, in the industrial world, is one of the most important things to consider. He said that habit is certainly amenable to control and is one of the greatest forces we can control. So important is this element of habit that it appears to be a veritable master key for the industrial list. The only way to build up a strong purpose is to keep nurturing our preferred thought. The real way to do this is by bringing these thoughts repeatedly into our mind, until finally one becomes a power on the line established by his own choice. In stating that an entire organization runs automatically when each man has only a limited number of tasks to perform, he added that the point where the worker becomes tired from sheer monotony so as to lose interest should be avoided by a gradual change for progress. He said that the habit of progress can be aquired as easily as that of stagnation. He concluded as follows:

> It is well at all times to get back to nature, to the underlying principles on which are built these magnificent industrial structures which have grown from smaller enterprises. They represent the human factor in its highest state or organization. It is best to go back to the study of elementary principles, to the study of the human factor, so as to give each man a chance to use his mind and body to the best advantage. We will give every man a wholesome and natural employment at a profit to the organization that will make good pay to him not only possible, but desirable.
>
> We will spread the gospel of specialization and the desirability of furnishing an efficient use of each brain and body. If the country will only take up and follow this lead of specialization we will gain commercial and industrial supremacy. But if we tear down the forms of organization where they are favorable to specialization we will make a most serious blunder.

Conference on Workmen's Compensation

Representatives of many States participated in a conference held in New York, November 25 and 26, under the auspices of the National Civic Federation to discuss workmen's compensation laws and to plan for uniform State legislation. There was a general representation of State commissions on workmen's compensation in view of the fact that in 38 States legislatures soon to meet will take action on this subject. August Belmont, chairman of the National Civic Federation's department on compensation for industrial accidents and their prevention, presided. Delegates were present from a number of labor unions.

Francis Lynde Stetson, discussing the situation in New York State, said that a constitutional amendment seems necessary. He reviewed the Ives case, in which the New York employers' liability act was declared unconstitutional and said that it would be difficult, without an amendment to the constitution, to sustain any compulsory compensation act imposing liability upon an employer who was free from fault in any case of accident.

Walter S. Bucklim, vice-president of the Massachusetts Employers' Insurance Association, said that the hardest problem was how to insure the payment of compensation and to distribute it to the employees. He thought that his State had solved it by providing for distribution through the private mutual insurance association of which he is an officer. Charles Henry Butler, speaking for the American Bar Association, said he believed that a compensation for industrial accidents in New York should be compulsory and adequate. Judge John T. McDonough, counsel for the New York State Federation of Labor, said that if a constitutional amendment were submitted as proposed by Mr. Stetson, preliminary to a new compensation act, there was no assurance that it would be adopted, since amendments are often rejected at elections. He warned those present against playing into the hands of the casualty companies. Frank V. Whiting, general claims attorney for the New York Central, emphasized the necessity for continuing to deal directly with employees. Under a State insurance scheme the employer would tell his men to collect damages from the State commissioners without bringing him into the matter.

W. Tecumseh Sherman, chairman of the National Civic Federation committee on compensation, opposed the Ohio plan of having employers insure with a political board of commissioners. While this Ohio insurance is at lower rates than anywhere else he predicted that there would soon be a deficiency and that the rates would go up.

Other speakers were: Thomas J. Curtis, president of the Tunnel Workers' Union and chairman of the Joint Compensation Board of New York; W. L. Saunders, president Ingersoll-Rand Company; John Fitzgibbons and Timothy Healy, presidents of railroad employees' unions.

Engineers' Society of Buffalo Organized

At a meeting attended by more than 150 Buffalo, N. Y., engineers, held at the University Club in that city, Thursday evening, November 21, the Engineers' Society of Buffalo was organized by the election of officers and the adoption of a constitution and by-laws. Following the business meeting Dr. George B. Waterhouse of the Lackawanna Steel Company gave an address on "Manufacture, Properties and Treatment of Steel, Including Recent Developments." The meeting was called by a committee on permanent organization, appointed some months ago on the initiative of Buffalo members of the American Society of Mechanical Engineers and consisting of W. H. Carrier, chief engineer, Buffalo Forge Company; W. M. Dollar, consulting engineer, Erie County Bank building; J. W. Gibney, manager, Taylor Iron Works, and S. B. Daugherty, chief engineer, Gas Engine Department, Snow Steam Pump Works.

At a meeting of directors of the LaBelle Iron Works held in Steubenville, Ohio, on Tuesday, the resignation of Isaac M. Scott, president, was presented and recorded, but no action was taken looking to the appointment of his successor. It is probable that the office will not be filled for several months. It is the intention of Mr. Scott, when he retires from the LaBelle Iron Works, to give his entire time to the Wheeling Sheet & Tin Plate Company, of which he is a director and a large stockholder. It is probable that he will be made president of the company.

Ohio Mechanical, Electrical and Steam Engineers

The twenty-sixth annual meeting of the Ohio Society of Mechanical, Electrical and Steam Engineers was held at Akron, Ohio, November 21 to 23. An interesting programme was carried out which included the reading and discussion of the following papers: "A System of Gas Engine Governing," by George S. Cooper, mechanical engineer, Buckeye Engine Company, Salem, Ohio; "The Lentz System Applied to Steam Engines," by Siegfried Rozenweig, mechanical and consulting engineer, Erie City Iron Works, Erie, Pa.; "The Manufacture of Tin Plate," by Ed. W. Patton, master mechanic, Follansbee Brothers Company, Follansbee, W. Va. Inspection trips were made to the plants of the B. F. Goodrich Rubber Company, Northern Ohio Power Company and Babcock & Wilcox Company. The society previously had a membership of 257, now increased by about 40 additional names. The following officers were elected: President, E. M. Adams, Akron; vice-president, Mason Chilcote, East Liverpool; managers, E. H. Jewett, Toledo, and David Gaehr, Cleveland. The next meeting will be held in Springfield, Ohio, in May, 1913.

A Canadian Sheet Metal Consolidation

A consolidation has been effected of the Metal Shingle & Siding Company, Preston, and A. B. Ormsby, Ltd., Toronto, Canada, and the new company, which will conduct its business under the name of the A. B. Ormsby Company, Ltd., has become a subsidiary of the U. S. Metal Products Company, College Point, Long Island, N. Y. Large factories are to be built in Toronto and Winnipeg. The total capital stock of the combined Canadian companies is to be $1,500,000. The directors are the following: C. Dolph, Preston; A. B. Ormsby, Toronto; A. E. Cameron, Montreal; H. C. Randall, New York City; J. D. Murdock, Simcoe, Ont. The products of the Canadian factories have been metal shingles and siding, and they will also manufacture a patent steel door, steel trimming, hollow bronze work and industrial sash. The new factories will be equipped with the most improved machinery for the purpose of handling large contracts such as have recently been awarded to American manufacturers.

Women in Foundry Core Rooms

A delegation of foundry owners appeared before the New York State Factory Commission at Albany, November 25, in opposition to some provisions in proposed legislation regulating employment in foundries. These included requirements for separate rooms for the cleaning of castings, also a provision that core rooms where women work have a partition high enough to separate the ovens from the open space where the cores are made and that they be so constructed that the gases and fumes from the core ovens will not enter the room or space in which the women are employed. A representative of the iron molders' union urged that a law be passed forbidding the employment of women in foundry core rooms. A. E. McClintock, commissioner of the National Founders' Association, who was one of the foundrymen's representatives at the hearing, said that only 200 women are employed in foundries in New York State.

The Alexander Milburn Company is now occupying its new premises, 1420-22-24-26 West Baltimore street, Baltimore, Md. Less than two years ago the company increased its space materially by taking an additional building, expecting thus to have ample room for several years, but requirements so increased that it was necessary to seek larger quarters. The new building was purchased in late summer and has been remodeled and thoroughly equipped for factory and offices. The company manufactures extensively various kinds of acetylene apparatus, including portable lights, house lighting machines, oxy-acetylene welding and cutting plants and the steam acetylene system for locomotive headlights.

Corrigan, McKinney & Co., Cleveland, Ohio, have an inquiry out for a bascule lift bridge with 160 ft. span to be built across the Cuyahoga River to connect their blast furnaces with their proposed steel plant.

The Ore Rate Hearing

WASHINGTON, D. C., November 26—In the case of the Youngstown Sheet & Tube Company against the Pittsburgh & Lake Erie Railroad and others, regarding ore rates, the defendants began the presentation of their defense last Thursday. James P. Orr, assistant freight traffic manager of the Pennsylvania Lines west of Pittsburgh, took the stand and placed a series of statistics and tables in the record which he said justified the present rate. Yesterday, R. M. Schroyer, of the same company, testified; he claimed that the cost of handling iron ore on the lines he represented showed that the present rate was reasonable. He also criticised figures presented by J. P. Muller, an accountant, who testified for the complainants, and said that they were unreliable and theoretical. It is expected that the testimony will close by Wednesday when dates for the filing of briefs and argument will be fixed. W. L. C.

The business of J. G. White & Co., Inc., 43-49 Exchange place, New York, has been separated into three parts to secure greater efficiency and profit. J. G. White & Co., Inc., continues as the parent company; the J. G. White Engineering Corporation will take over the engineering construction department, and the J. G. White Management Corporation will take over the operating department. The second company named will have an authorized capital stock of $2,000,000, of which $1,000,000 will be common and $1,000,000 7 per cent. preferred stock. The third will have an authorized capital stock of $1,000,000, of which $500,000 is to be common and $500,000 7 per cent. preferred stock. The business of J. G. White & Co. was established in 1890 and was incorporated under Connecticut charter in 1903.

The H. W. Johns-Manville Company has opened a new Southern warehouse on South Broad street, Atlanta, Ga. The entire building, embracing three stories and a basement, with total floor area of about 10,000 sq. ft., will be utilized exclusively as a warehouse for a stock of such J-M products as roofing, boiler and pipe coverings, cements, packings, fire extinguishers and electrical, railroad and automobile supplies. The Atlanta office of the company will be in the same building with the warehouse, which will materially help to minimize the chance of delay in deliveries.

The Wheeling Corrugating Company, Wheeling, W. Va., has brought out a new type of metal ceiling which is known as the encaustic burnt-on enamel ceiling. This enamel is burnt on to give a brilliant and durable gloss and at the same time retain the elasticity necessary to permit the ceiling being erected without damage. An extra coat is burnt on the back to furnish protection from any dampness or moisture that may collect upon it.

The Inventors' Show held in the Coliseum, St. Louis, Mo., November 11 to 16, had a large number of exhibits, chiefly new devices not yet on the market to any extent or in an embryo stage. The exposition was well attended, and the announcement was made at its close that a number of the inventions had been taken up by capitalists with a view to their exploitation.

The report that the Midland blast furnace of the Pittsburgh Crucible Steel Company will be blown out in the near future for relining is untrue. It is expected that it will run for a year or more on its present lining. On Monday last the furnace made 444 tons of basic iron. It has been in continuous blast on the present lining for about six years.

A report from Pekin says that the Chinese Minister of Commerce and Industry has drawn up a plan for an iron works at Shanshi, with a view to the development of the mining industry in that district, the resources of which are reported well nigh inexhaustible.

The 23-28 in. mill of the Pencoyd Iron Works, Pencoyd, Pa., made a new high record November 22, day turn, rolling 508 gross tons of steel into 15-in. eye-bars. Two cobbles were made, and the time lost from sundry delays was 1 hour 56 minutes.

Iron and Steel Production in France

The production of pig iron in France in the first half of this year, by works included in the Comité des Forges de France, amounted to 2,345,003 metric tons against 2,191,986 tons in the first half of 1911. The steel ingot production in the first six months of 1912 was 1,981,235 tons against 1,852,685 tons. Basic Bessemer steel made up 66.6 per cent. of the total this year as against 64.1 per cent. in the first half of 1911. Open hearth steel this year amounted to 30.9 per cent. against 33.2. The production of iron ore in France in 1911 amounted to 14,828,000 metric tons. Pig iron output was 4,508,022 tons; steel ingots, 3,868,648 tons against 3,413,304 tons in 1910. The production of steel rails, sleepers, etc., in 1911 was 449,818 tons against 498,467 tons in 1910; of tin plates, 37,471 tons against 41,449 tons.

Mexican Iron and Steel Production

The American Iron and Steel Association's report for 1911 gives the following estimates of production in Mexico in 1910, as made by John Birkinbine of Philadelphia: Coal, 1,500,000 metric tons; iron ore, 133,000 to 142,000 tons; pig iron, 70,000 to 75,000 tons; steel ingots and castings, 90,000 to 100,000 tons. The Monterey Iron & Steel Company, Monterey, produced 23,546 tons of steel rails in 1910, and 25,056 tons in 1909. Its production of structural shapes in 1910 was 14,159 tons.

Large Contract for Gas to Replace Fuel Oil

In view of the refusal of the Standard Oil Company, of Indiana, to renew present contracts for fuel oil, the Ford Motor Company, Detroit, has contracted with the Detroit City Gas Company for a daily supply of 2,000,000 cu. ft. of gas for operating heat treating furnaces, and for other uses throughout the plant. The Ford company estimates that for its expected increase in output its gas requirements will double in the next year. The gas company is planning for additional capacity, a battery of coke ovens being under consideration.

Under an agreement recently reached with railroads affected, the Youngstown Sheet & Tube Company will begin work in the spring on the changing of the course of the Mahoning River at the western end of its works in East Youngstown, Ohio. In doing this, the company will secure 69 acres more, immediately adjacent to the works, to be used for whatever additions it may desire to make.

The Brier Hill Steel Company, Youngstown, Ohio, has placed a contract for 17 cranes for its new open-hearth plant with the Morgan Engineering Company, Alliance, Ohio. The purchase includes two 150-ton ladle cranes, two 100-ton ladle cranes, two soaking pit cranes, two low type open-hearth cranes and nine standard cranes of 10 to 20 tons capacity. All are long span cranes of heavy mill type.

The Columbia Tool Steel Company, Chicago Heights, Ill., will double the size of its present crucible steel building, making it 150 x 350 ft. Other proposed improvements include a drill rod and drawn steel department, 80 x 200 ft.; a cold and hot rolled sheet mill, 100 x 250 ft., and an open-hearth plant, 100 x 450 ft., for the manufacture of special grades of steel.

The Thomas C. Basshor Company, contractors' and machinists' supplies, Baltimore, Md., has been placed in receivers' hands on application of C. Hazeltine Basshor, vice-president and general manager. J. Albert Hughes is receiver. It is stated that the company is solvent but a receivership was deemed necessary for special reasons.

The plant of the Automatic Sprinkler Company of America, Youngstown, Ohio, is so nearly completed that it will be occupied by December 15. The main building is of brick, steel and concrete construction, 240 x 400 ft.

The Machinery Markets

Reports from several important distributing centers reiterate that activity in machinery lines is of a highly satisfactory sort, while others indicate a quieter state of trade for which the season is to a large extent accountable. The New York trade in the last week has been mostly concerned with small transactions, the aggregate of which make conditions better than they were at this time a year ago. Moderate sales were made by the Philadelphia trade. Excellent activity is maintained in New England, where all appearances are those of prosperity. The Chicago market exhibits no indication of the supposed conservatism in buying which has been mentioned of late; inquiries are plentiful and in some cases machine tools have advanced 5 to 10 per cent. in price. Demand has fallen off slightly in Cleveland, although electrical and steam power plant equipment are moving well and foundries are behind in deliveries. Cincinnati has experienced an improvement in demand from automobile builders, but the export business is quieter and is not expected to become brisk until after January 1. Local business has picked up in Detroit and metal working tools have sold fairly well. In the Central South distillery equipment is active and general inquiries are coming forward in good volume. Birmingham continues to enjoy a good demand from the busy sawmill sections and mining regions. Conditions in St. Louis are fair. The Texas situation continues very good with new projects coming to light daily. The best feature of trade on the Pacific coast has been the placing of business by the Western Pacific Railroad.

New York

NEW YORK, November 27, 1912.

The continuation of miscellaneous business, the aggregate of which reaches fair proportions, is the feature of the New York market. Since the election there has been some recovery from the lull which prevailed at that time, but while activity is pronounced fair there is an absence of the "snap" that characterized the closing of deals a few weeks ago. It is recognized that with the approach of the close of the year buying is likely to fall off, if for no other reason than the desire to make yearly statements appear as favorable as possible. Not a little new business usually goes over to the next year for this reason. At the present moment, however, trade is better than it was at the same time a year ago. Much of the orders and inquiries as well for machine tools are for one or two units, and the smaller types of machines are in greatest demand. The movement in automatic screw product machines has been good throughout the month.

The Simms Magneto Company, Bloomfield, N. J., previously referred to as being in the market for a number of turret lathes, has closed for 14. The Vitaphone Company, Plainfield, N. J., in the last week placed orders for a number of high speed sensitive drills. The Jersey City Technical High School was the buyer of a few grinders and drills.

The International Typesetting Machine Company, Brooklyn, frequently mentioned of late as a purchaser of tools for its new plant, is opposing a strike of machinists who are trying to force the company to readjust its overtime rate.

The Duryea Mfg. Company, 69 Wall street, New York, has purchased a factory site on the New York bay shore, Greenville, Jersey City, N. J. The property is 219 x 220 ft. and extends from the Lehigh Valley Railroad to the water front. Ground will be broken at once for a plant comprising three one-story manufacturing buildings, a power house and an office building, which will give it about 20,000 sq. ft. of floor space. The company manufactures cotton belting and lubricating oils, operating two separate plants which it intends to consolidate at its new location.

The Ogden Iron & Steel Company, 147 Cedar street, New York, has leased for a term of years factory premises at Forty-ninth street, adjoining the Lehigh Valley Railroad, Bayonne, N. J. Construction has begun on the main building which will be one and two stories and have 20,000 sq. ft. of floor space. The company now operates a plant in the Bergen Point section of Bayonne, manufacturing bolts, spikes, etc. The new plant will be occupied by the Ogden Iron & Steel Company and the Star Expansion Bolt Company, a subsidiary. It will move its machine shop and other equipment for the manufacture of expansion bolts and will supplement it with other equipment. The company is now planning to erect other buildings on the new site which will give it an ultimate floor space of 60,000 sq. ft.

The New York Dock Company is planning to erect a concrete building on its Brooklyn water front property for the use of the William H. Jackson Company on a long lease. The building will be in three sections, one 240 ft. long, six stories; one 210 ft. long, three stories, and another of three stories to contain a foundry. The William H. Jackson Company is a manufacturer of mantels, fireplaces and other architectural material.

The Sand Mixing Machine Company, 220 Broadway, New York, has an inquiry out for the folowing second hand machinery for installation at its Greenfield, Ohio, plant: One No. 2 milling machine, one gear cutter, one key seater, one 20 in., two 14 in. and one 12 in. lathe; one 30 in. and one 20 in. drill press; one 14 in. sensitive drill, a case hardening furnace and blackhmith's outfit.

The Alexander Smith & Sons Carpet Company, Yonkers, N. Y., will erect an extensive addition of brick construction to their Axminster mill; building permit for same has been taken out.

The Volney Paper Company, Fulton, N. Y., has plans in preparation for a power house 50 x 35 ft., of reinforced concrete, which it will add to its plant.

The Fabrikoid Works, West Newburgh, N. Y., has completed plans for three additional factory buildings which it will erect at its plant at that place.

The city of Albany, N. Y., has had plans prepared for the construction of a pumping plant in connection with a sewage disposal system of 30,000,000 gal. daily capacity, for which plans have been completed by Hering & Gregory, engineers, 170 Broadway, New York City.

The General Vehicle Company, Albany, has been incorporated with a capital stock of $10,000,000 to manufacture vehicles of all kinds, and to operate and to contract for their operation. The principal office will be in the town of Rotterdam, Schenectady County. The directors are A. H. Jackson, S. L. Whitestone, J. F. Zeller, Richmond D. Most, W. F. Story, C. W. Stone of Schenectady and J. P. Eaton of Albany.

The Webster Dehydrating Corporation, Webster, N. Y., has been incorporated with a capital stock of $30,000, and will build a plant for dehydrating and preserving foods, vegetables, fruits, etc. C. Van Nostrand, W. Brooks and W. J. Lee, New York City, are the incorporators.

The General Electric Company is adding to its plant at Schenectady, N. Y., a repair shop and storage building 102 x 203 ft., one story, of concrete construction, to cost $56,000.

The Alpha Portland Cement Company has placed an order with the Mesta Machine Company, Pittsburgh, for three gas engines, direct connected to 600 kw. alternating current generators, to furnish power for the new extension to its plant at Cementon, N. Y., doubling its capacity. The company is also planning to add an extensive kiln building to its plant at Alsen, N. Y.

The United Indurated Fibre Company, Lockport, N. Y., has broken ground for an addition to its plant to be 250 x 200 ft. and to be used for the manufacture of pulp and paper in connection with the other products of the company, which now consist mainly of fiber ware.

The American Telephone Fire Alarm Company, Inc., Rochester, N. Y., has filed articles of incorporation with a capital stock of $5,000,000, and will establish a plant for the manufacture of fire alarm, telephone, and telegraph apparatus, etc. W. S. Harring and F. H. Smith are among the incorporators.

The Kawild Company, Rochester, N. Y., has let a contract for a four-story factory building 65 x 125 ft. of brick and reinforced concrete to the Columbian Con-

crete Steel Bar Company, 25 East Twenty-sixth street, New York City.

The Laclede Mfg. Company, Buffalo, 1443 Niagara street, manufacturer of paints, etc., has purchased a site at West and Forest avenues and is preparing plans for a factory building 50 x 165 ft., four stories and basement of concrete construction to be erected there.

The Niagara Gasolene Motor Company, Buffalo, N. Y., is being reorganized and will be incorporated under the name of the Niagara Motor & Mfg. Company, Inc., with a capital stock of $275,000. The new company is now erecting a factory at Dunkirk, N. Y., on a site of four acres recently purchased. The building will be 105 x 200 ft. of concrete and steel, with steel sash, and will be equipped with new machinery. The company will manufacture marine motors exclusively. The factory and office of the company will continue at 182 Breckenridge street, Buffalo, until transferred to Dunkirk.

Whitmer & Brown, contracting engineers, Chapin Block, Buffalo, have completed plans for a water works system to be built at Mexico, N. Y., estimated to cost $50,000.

William Beilman is building a two-story brick factory at 448-450 Niagara street for the manufacture of Beilman-Seamens water heaters.

Catalogues Wanted

The Indiana Die Casting Development Company, Indianapolis, Ind., is in the market for machinery, small tools and foundry supplies and desires catalogues, etc., of manufacturers.

New England

BOSTON, MASS., November 26, 1912.

A steady, consistent demand is experienced by the local dealers and by the manufacturers of machine tools and other shop and mill equipment. Everyone seems prosperous; the exceptions are scarce. Machine tool prices appear to indicate an inclination to advance, while deliveries are unchanged. The much looked for Boston & Maine list has not been received.

Announcement is made at New Britain, Conn., that the newly incorporated Hart-Hutchinson Mfg. Company, which has taken over the steel locker department of the Hart & Cooley Company of that city, has purchased a large tract of land adjacent to the New York, New Haven & Hartford Railroad, and will erect large works. Tentative plans call for a one-story building about 600 ft. long.

The Babson-Dow Mfg. Company, Boston, Mass., manufacturer of screw machine products, is occupying its new factory at Roxbury, on Atherton street, between the Egleston Square station of the Boston Elevated and the Boylston street station of the New York, New Haven & Hartford Railroad. The building is 60 x 250 ft., four stories and basement. The Babson-Dow Company occupies the first floor and basement and has ample opportunity for growth in the future. The building is of fire-proof construction, modern in every respect, with a maximum window area. The power plant is in a separate building. The equipment is very complete, consisting of National Acme, Gridley, Brown & Sharpe and Hartford Machine Screw Company's machinery, including both single spindle and multi-spindle types, thus affording opportunity for a wide adaptation of machine to product. The company will not manufacture standard machine screws, but is equipped for all classes of screw machine products from 1/64 to 4 in. in diameter. The corporation is a new one. J. Payson Bradley is president; John MacGregor, vice-president; R. M. Currier, treasurer, H. F. Dow, superintendent, and R. B. Babson, general manager. Mr. Babson was fomerly the Boston manager of the Hartford Machine Screw Company and previously was with the Billings & Spencer Company. Mr. Dow is a former Pratt & Whitney man and for 15 years has been with the United Shoe Machinery Company in charge of the screw machine department of the works at Beverly, Mass.

The Wyman & Gordon Company, Worcester, Mass., has purchased from the International Power Company the large works at Southgate and Armory streets, Worcester, the purpose being to provide for the future extension of the Wyman & Gordon works. The new property consists of over 90,000 sq. ft. of land, with buildings which have not been occupied for some time. The drop forging and specialty business of the Wyman & Gordon Company has grown with great rapidity and new buildings have just been erected at the present plant on Bradley street and little available space is left for other extensions. The new property will afford the opportunity for large future operations.

The Critchley Machine Screw Company, Worcester, Mass., has purchased the stock and machinery of the Reed & Curtis Machine Screw Company, Worcester, Mass., a department of the Reed-Prentice Company. The sale does not include the real estate, but James Verner Critchley, the owner of the business which bears his name, has taken a lease on the building for a term of years and will operate the plant. The company recently erected a large factory on Armory street, but the growth of the business has been so rapid that no space is available for the Reed & Curtis equipment. The company has absorbed several small machine screw plants and their equipment has become an important factor in the factory. The Reed & Curtis Company was established in 1895. The business was started in Springfield, Mass., by Albert B. Curtis, and F. E. Reed, founder of the F. E. Reed Company, became a large owner at the time of the incorporation. The business was included in the consolidation which brought together the Prentice Brothers Company and the F. E. Reed Company.

The Skinner Chuck Company, New Britain, Conn., has purchased the planer chuck department of the Frances Reed Company, Worcester, Mass., and has moved the stock of finished material and patterns to its works. The Frances Reed Company builds a line of drilling machines and has manufactured the Jordan planer chuck as a side line for over 20 years. Wishing to concentrate its energies on its machines the chuck business was disposed of.

The Standard Machinery Company, Providence, R. I., has purchased six acres of land at Auburn, R. I., and has completed plans for the erection of a plant which will consist of three buildings. The site is about four miles from Providence, on the Shore Line division of the New York, New Haven & Hartford Railroad. The main building will be 175 x 350 ft., the forge shop 100 x 100 ft., while the boiler and engine house will be 60 x 60 ft. The company plans to break ground immediately and proposes to occupy the plant in the spring. New engines and boilers will be installed, as well as an electric traveling crane and new steam hammers. About three times the present manufacturing space will be obtained. The company is now located at 7 Beverly street, Providence, occupying the first floor of a large industrial building. The new works will add greatly to the convenience and efficiency in manufacturing. The company builds presses of all kinds, drop hammers, rolling mills, wire drawing machinery, rotary swaging machines, dies and special tools and roller and ball bearings.

Additions to general manufacturing facilities in New England include the following: Matthew J. Whittall, Worcester, carpets, machine dyeing building 25 or 35 ft., two stories; Strathmore Paper Company, Woronoco, Mass., power plant, including boiler room, turbine room and fuel building; J. J. Doyle & Son, Hartford, Conn., factory 30 x 50 ft.

The Coe Brass Company, Torrington, Conn., branch of the American Brass Company, is planning an addition to its works, which will be used as a tube mill.

The Norton Company, Worcester, Mass., is making extensive additions to its works. A large three-story administration building is nearing completion and in addition to offices will contain the research laboratories which have become a vital factor in developing and maintaining the quality of the Norton products. Six large kilns are approaching completion, supplementing the six which were finished in 1911. An addition to plant 2 will make room for the growth and development of a line of alundum refractories and laboratory ware which were recently introduced to the market. Another new structure is the abrasive storage building.

Philadelphia

PHILADELPHIA, PA., November 26, 1912.

Moderate sales of the standard classes of machine tools are reported, although some builders of special machinery have experienced a slight lull. Buying is evidently being conducted along conservative lines. Crane builders report a fair business and are booked to capacity for months ahead. Manufacturers of both standard and special equipment continue well engaged and look forward to more active conditions, although seasonable year-end dullness is considered not unlikely. Second-hand machinery merchants report trading as being only fair. Following inquiries noted from railroads last week the demand has again become quiet.

Here and there reports of falling off in the demand for machinery castings are heard, although both iron and steel foundries are comparatively active.

Bids are being taken on revised plans for the proposed factory for the Collins Carriage Company at Front and Federal streets, Camden, N. J. Plans call for a brick factory building, 90 x 100 ft., three stories, and modern factory equipment.

The Bridgeton Iron Works, Bridgeton, N. J., whose plant was recently destroyed by fire, will erect a new foundry building, 90 x 108 ft. Equipment plans call for a 10-ton electric crane, 40 ft. span; a two ton traveling crane with floor control; two cupolas, 63 in. and 42 in. sheils; one air compressor; two tumblers, one 48 x 28 in. and one 30 x 18 in.; two 20 or 25 hp. motors, 3000 to 4000 lbs.; pneumatic elevator, pressure blower, chipping hammers and other general foundry equipment. Power for operating the plant will be obtained from a local electric company. David Townsend is the architect and engineer.

The Tabor Mfg. Company is actively engaged, although the demand for molding machines shows a slight recession over that of last month. Considerable business, however, has been taken in machines of the squeezer and roll over types. This concern is now preparing to make deliveries on an order for 30 vibrator frame squeezer machines for the General Electric Company.

Owen Letters & Sons, Trenton and Westmoreland avenues, are receiving bids for an extensive coal pocket and trestle to be erected at the above location.

The J. W. Paxson Company reports a heavy demand for all classes of foundry equipment, deliveries of which are somewhat held up by the inability to obtain cars, particularly for shipment of molding sand. This concern is considering the installation of additional equipment, including grab buckets and industrial railways in connection with one of its sand plants.

A report, as yet unconfirmed, credits the Pennsylvania Railroad with plans for extensive enlargements at its Altoona shops. These are said to include a new engine house and additions to machine and blacksmith shops. It is also stated that a mechanically operated coaling station and a power plant will be installed.

Dienelt & Eisenhardt, Inc., is busy in all departments of its plant. Sales of a number of dead stroke hammers, particularly in the smaller sizes, are noted. Recent orders for Lovekin pipe expanding machines include one for the Mare Island Navy Yard. This company is now placing on the market a new magnetic separator particularly adaptable for use in the drug and paint trade.

The Alfred Box Company is busy in both its electric crane and hoist departments, having sufficient business on its books to keep it actively engaged for many months. It is now installing a 125 hp. Nagle Corliss engine, and will ultimately purchase additional machinery equipment. Recent shipments of cranes and hoists by this company include six 3-ton 2-motor electric hoists to the Canadian Pacific Railway; a 20-ton hand power traveling crane, 60 ft. span, to San Domingo; a 15-ton 3-motor 50 ft. electric traveling crane to the Dominion Iron & Steel Company, and an 18-ton 3-motor, 40 ft. traveling crane to the International Smelting & Refining Company in Mexico.

The McClintic-Marshall Construction Company, Pittsburgh, has taken a contract for the erection of a foundry building 90 x 200 ft., one story, of steel frame and corrugated iron, for the Eagan-Rogers Steel & Iron Company at Crum Lynne, Pa., to cost $50,000, on plans by Bradley Stoughton, engineer, 165 Broadway, New York.

The Morris Iron Company, Frederick, Md., will install a steel casting plant to cost $60,000. It will remove its present cupolas and sand blast department to another location and install its casting plant in the space thus provided.

Chicago

CHICAGO, ILL., November 26, 1912.

The number of inquiries for machine tools and the apparent necessity of their being purchased promptly show practically no abatement from the very encouraging activity of the past few weeks. If a disposition to conservatism and toward the curtailment of shop extensions is felt it is not yet apparent. Important inquiries for machines for general manufacturing purposes have been received from central Illinois, from the Milwaukee district and from other Wisconsin manufacturing centers. A large canning interest has bought tools aggregating about $10,000 in value and other orders, including a 72 in. boring mill and a 5 ft. radial drill, are noted. The date of placing orders by the railroads, whose large lists have had the attention of the machinery market for several weeks past, continues indefinite. The Atchison, Topeka & Santa Fé has sent out a small list of tools for figures including a 16 in. x 6 ft. lathe, a 36 in. x 18 ft. lathe, a 20 in. shaper and a 2 in. single head bolt cutter. Several manufacturers of machine tools have sent out notices of an advance in prices amounting to from 5 to 10 per cent. This is not surprising, in view of the amount of business now on the books of most machinery makers.

Sears, Roebuck & Co., Chicago, are erecting on a site opposite their present warehouses, a five story building, 125 x 200 ft., for general manufacturing purposes. It will cost $175,000. This company is also erecting at South Fifty-second avenue, near Twenty-second street, a plant for the exclusive manufacture of saws. It consists of a metal working building, 221 x 257 ft., and a tempering building, 50 x 100 ft. The plant will cost $40,000.

The Champion Mfg. Company, Chicago, manufacturer of wood screws, has filed notice of an increase in its capital stock from $200,000 to $250,000.

The Illinois Malleable Iron Company, Chicago, has taken out a permit for an addition to its plant at 2830 North Paulina street, to cost $8,500.

The Kottusch Patent Pulley Mfg. Company, 38 South Dearborn street, Chicago, has been incorporated with a capital stock of $75,000 by Emil Kottusch, Emil Schmidt and W. J. Hyde.

C. H. Besly & Co., Chicago, manufacturers and distributers of machinery and machinists' supplies, announce that extensive additions to their plant at Beloit, Wis., are contemplated for the near future.

The Lyon Metallic Mfg. Company, Montgomery, Ill., whose plans for factory enlargement were recently noted, has awarded the contract for a building 100 x 200 ft., one story.

The Martin Company, Sac City, Iowa, is building a two story factory building, 28 x 64 ft., the lower floor of which is to be a machine shop.

The New Foundry & Mfg. Company, Sioux City, Iowa, has been incorporated with a capital stock of $50,000 to take over the plant of the former Sioux City Foundry & Mfg. Company. D. C. Shull is president; C. M. Stillwell, vice-president and secretary, and E. Root, treasurer. A general machine shop and foundry business will be conducted.

The Hall Mfg. Company, Monticello, Iowa, maker of garden tools, is building an addition to its plant which will provide 3000 sq. ft. more floor space.

The Gerlinger Steel Casting Company, Milwaukee, Wis., has acquired additional adjoining property and an enlargement of its plant is contemplated.

The Koehring Machine Company, Thirty-first street and Concordia avenue, Milwaukee, Wis., has taken out a building permit providing for an addition to its factory to cost $25,000.

The Belle City Malleable Iron Company, Racine, Wis., has increased its capital stock from $125,000 to $500,000 and has under way plans for considerable plant extension.

Detroit

DETROIT, MICH., November 26, 1912.

A fair number of sales of metal-working tools are reported, but no business of great importance has come out. Inquiries also can only be classed as fair, although the strictly local business is picking up. Woodworking equipment is in better demand. A fair amount of business in second-hand machinery is moving, with the demand steady for all lines. Power transmission equipment is dull. Conditions in the foundry trade are unchanged, nearly all plants being busy and operating at almost full capacity. Work in building circles is rather quiet throughout the State, with very few exceptions.

The Michigan Folding Box Company, Detroit, has been incorporated with $100,000 capital stock to manufacture a line of patent collapsible shipping cases. The company proposes to erect a factory in the near future. C. A. Xordell, Utica, N. Y., is president; H. W. Brown is treasurer, and George W. Hartley, secretary and general manager, Detroit.

The Briggs-Detroiter Company, Detroit, automobile manufacturer, has acquired a tract of three acres adjoining its plant, to provide for future extensions.

The Oliver Motor Truck Company, Detroit, has been organized to take over the holdings of the defunct Oliver Motor Car Company and will soon begin the manufacture of automobiles. The company has estab-

lished a factory at 460 Lawton avenue. Augustus A. Meyer is president and general manager of the reorganization.

The Morse-Beauregard Mfg. Company, Detroit, manufacturer of motor cycles, has filed notice of an increase of capital stock from $10,000 to $100,000.

The Everitt Motor Car Company, Detroit, has acquired a tract of 10 acres in Windsor, across the river from this city, and is having plans prepared for the erection of a group of buildings, the estimated cost of which is $75,000. The plant will be operated by a separate organization from the Everitt Company under the style of the Tudhope Motor Company.

The Swedish Crucible Steel Company, Detroit, is completing its new plant and expects to have it in operation by December 1. The company is now considering the construction of another addition 75 x 175 ft.

The Hahn Machine & Specialty Company, Detroit, has been incorporated with $5,000 capital stock to manufacture specialties. The incorporators are William Hahn, Edward Gregory and Constant De Mattia.

The New Britain Machine Company, New Britain, Conn., has established an office in Detroit, with Thomas C. Stirling in charge. The company's multiple spindle automatic chucking machines are used extensively in the automobile industry.

The American Sign Company, Kalamazoo, Mich., has acquired a site and will proceed immediately with the erection of a plant to cost about $60,000. It is understood that the company is also contemplating the erection of a branch plant in New York.

The Pontiac Motor Castings Company, Pontiac, Mich., has been incorporated with $8,000 capital stock for the purpose of manufacturing steel and brass castings. William J. Brown, Pontiac, and Peter J. Donnelly and Timothy E. Lyons, Detroit, are among the incorporators.

The Star Furniture Company, Zeeland, Mich., has begun the erection of a considerable addition to its plant.

The Grand Rapids Foundry Company, Grand Rapids, Mich., has awarded the contract for the building of a two-story foundry, 50 x 100 ft. A pattern shop and core room will be included in the new building.

Cleveland

CLEVELAND, OHIO, November 26, 1912.

The machine tool demand has fallen off somewhat and the market is rather quiet. Dealers are getting a moderate volume of single tool orders but few orders for more than single tools were placed in the week and inquiries are light. The Upson Nut Company, Cleveland, which came in the market several weeks ago for machinery equipment for its new forge shop, completed its purchases with orders for a boring mill and lathe. Second hand machinery is moving fairly well. The demand for electrical equipment and steam power plant equipment is good. Makers of industrial cars and locomotives report a heavy demand for their products. Foundries are crowded with work and buyers of castings are having trouble in getting deliveries as desired.

David Round & Son, Cleveland, makers of hoists and chains, have moved into a new plant in Newburg, adjoining that of the Cleveland Chain & Mfg. Company, which is controlled by the same interests. The plant is a two story brick structure, 70 x 300 ft., equipped with Detroit-Fenestra metal sash. All the machinery equipment is motor driven. The plant provides about double the former capacity. For the present, offices will continue to be maintained at the site of the old plant, 7625 Broadway.

The Hydraulic Pressed Steel Company, Cleveland, has under way extensive additions to its plant. One new building is about completed and the erection of two others will be started shortly. These will provide 30,000 additional sq. ft. of floor space.

The Atlantic Foundry Company, Cleveland, will shortly begin the erection of an addition 110 x 200 ft. to its plant to provide room for the manufacture of medium and heavy castings. An additional cupola will be provided and an electric traveling crane will be installed.

The City of Cleveland has placed with the Allis-Chalmers Company, a contract for three complete units consisting of three steam turbines and alternating current generators of 5000 k.w. normal rated capacity. This equipment and other that will be placed later will be installed in the municipal lighting plant.

The Davies Mfg. Company, Alliance, Ohio, manufacturer of automobile parts, will shortly begin the erection of a large addition to its plant. The new building will be 200 x 600 ft., of brick and steel construction. The company is planning to add the manufacture of a gasoline engine to its present products.

W. R. Graham, Toledo, Ohio, is organizing a company for the manufacture of a line of special bottle blowing machines. Machinery equipment is being purchased for a plant.

The Commercial Club, Galion, Ohio, has accepted the proposition from the Morton Motor Plow Company for the establishment of a plant in that city. The company will be organized with a capital stock of $250,000. A. R. Morton and others are interested.

The North Electric Company has dismantled its Cleveland plant with the exception of the tool room and will shortly being the installation of equipment in its new plant at Galion, Ohio, which will be placed in operation January 1.

The Willys-Overland Company, Toledo, Ohio, which recently took over the Garford automobile plant at Elyria, Ohio, will erect a second addition to the Garford plant. The new building will be 40 x 200 ft. and will be used as a grinding room.

The Malleable Furnace & Mfg. Company, Cleveland, has been incorporated with a capital stock of $10,000 to manufacture heating apparatus. W. P. Wynn, president of the Crow-Wynn Heating Company, and others are interested in the new concern.

The Rubber City Machine Company, Akron, Ohio, has increased its capital stock from $10,000 to $30,000.

The Victor Brass Mfg. Company, Cleveland, has been incorporated by W. H. Mahon and others with a capital stock of $20,000. The company is arranging to operate a brass castings foundry.

Theodore Kundtz will erect a new factory building at Elm and Winslow avenues, Cleveland. The structure will be 100 x 133 ft. and six stories.

The K. W. Ignition Company, Cleveland, has awarded a contract for a plant addition 75 x 75 ft. It will be of brick construction, one story.

The Air-Vac Washer Company, Columbus, Ohio, has been incorporated with a capital stock of $10,000 to manufacture a new washing machine. David S. Beverly, George W. Campbell and others are the incorporators.

The Hocking Valley Mfg. Company, Lancaster, Ohio, has awarded a contract for the erection of a foundry building.

The Adams Husker Company, Marysville, Ohio, will enlarge its plant by the erection of a two story factory building 56 x 170 ft.

Cincinnati

CINCINNATI, OHIO, November 26, 1912.

A slight improvement is reported in machine tool orders from automobile manufacturers in different parts of the country. It is also stated that the railroads have been buying a larger number of single tools. Several extensive lists are out that have not been acted on yet and the railroads show no haste in purchasing any large number of tools. The export business continues slow and will probably show no improvement until after January. Second hand machinery dealers have had an active spurt, but business seems to have fallen back to the ordinary run of orders. The jobbing foundries are all busy, with indications of a still busier period ahead.

The Cincinnati Car Company has purchased the idle plant of the Armor Steel Castings Company at Winton place, and as soon as the sale is formally confirmed by the courts it is the company's intention to fit up the factory for the manufacture of street cars. No information is yet available as to the machinery requirements.

The Cincinnati Mailing Device Company has purchased the old Pollock foundry building and will soon install machinery for the manufacture of specialties. It is understood a number of electric motors will be required.

The Scallan Supply Company, Cincinnati, was recently incorporated to handle machinery supplies. Joseph H. Scallan is president of the new company.

The Brunswick-Balke-Collender Company, Cincinnati, will soon commence the erection of a large warehouse at Winton place. Part of the building will be used for manufacturing purposes, and it is probable that a lot of woodworking and power equipment will be required later on.

The Frink Pyrometer Company, Lancaster, Ohio, contemplates moving its plant to more commodious quarters at Main and Front streets.

The Hocking Valley Mfg. Company, Lancaster, Ohio, has had plans prepared for a new foundry addition, for which some equipment will be required.

The J. Leukert Company, Columbus, Ohio, has been incorporated with $30,000 capital stock to manufacture special woodworking machinery. J. Leukert is one of the principal incorporators.

The Bemiller-Fan-Blower Company, Butler, Ohio, has been incorporated with $5,000 capital stock to manufacture fan blowers. D. J. Bemiller is one of the principal incorporators.

The brick and steel addition to the plant of the Globe Automatic Sprinkler Company, Cincinnati, recently mentioned, is nearly completed and will soon be ready for the installation of the necessary equipment.

The Dayton Headlight Bracket Company, Dayton, Ohio, has been incorporated with $15,000 capital stock to manufacture a patented automobile lamp device. Henry Ehlen is one of the principal incorporators.

The Pomeroy Machine Company, Pomeroy, Ohio, is building a small addition to its plant at that point.

The Roche-Bruner Company, Johnston Building, Cincinnati, has been awarded contract for a large convention hall to be constructed for the National Cash Register Company, Dayton, Ohio, for which considerable structural steel will be rejuired.

The Crawford & McCrimmon Foundry & Machine Company, Brazil, Ind., has had plans prepared for an addition to its plant that will more than double the capacity.

Indianapolis

INDIANAPOLIS, IND., November 26, 1912.

Matthias Kirsch and Charles S. Niblick have been appointed receivers for the Ward Wire Fence Company, Decatur, Ind. The company is believed to be solvent, but there has been disagreement among the directors. It has a capital stock of $100,000. William A. Rundell is manager.

The Indiana Forging Company, Anderson, Ind., has moved to Indianapolis.

The Automatic Machinery & Sales Company, Indianapolis, has increased its capital stock from $30,000 to $40,000.

The VanCamp Packing Company's Indianapolis plant, which was burned November 16 with $300,000 loss, will be rebuilt. Much of the machinery used in manufacturing and packing vegetables was destroyed.

The Diamond Gas Engineering & Construction Company, Anderson, Ind., has been incorporated with $50,000 capital stock to design and construct gas plants. The directors are Horace C. Stilwell, Thomas N. Stilwell and Louis J. Diamond.

Fire destroyed the erecting shop of the American Car & Foundry Company's plant at Terre Haute, Ind., November 19, causing a loss of about $60,000. An oil pipe burst, leading to the furnace. The building was of brick, 60 x 250 ft., and with it 18 cars and the machinery in the building were destroyed.

The South Bend Motor Car Company, South Bend, Ind., has been incorporated with $10,000 capital stock to manufacture automobiles and parts. The directors are J. D. Farneman, A. C. Mecklenburg and H. Hammond.

The Northern Indiana Public Service Company, Crown Point, Ind., has been incorporated with $100,000 capital stock to supply interurban transportation and electric light and power. The directors are William R. Watson, Charles J. Huebling and L. Ota Heikes, all of Chicago.

The A. L. Lewis Company, Bluffton, Ind., has been incorporated with $15,000 capital stock to manufacture toys and light fixtures. The directors are A. L. Lewis, George A. Lewis and T. L. Prall.

The Kierner Furniture Company, New Albany, Ind., has been incorporated with $30,000 capital stock to manufacture furniture. The directors are William H. Kierner, George J. Kierner and George B. McIntyre.

Notice has been filed with the Indiana Secretary of State of the dissolution of the Indiana Chain Works.

The Westcott Motor Car Company, Richmond, Ind., has increased its capital stock $100,000.

The Crawford & McCrimmon Foundry & Machine Company, Brazil, Ind., has purchased 12 acres on which it will construct a new plant. It manufactures mine machinery and fans, but will extend its line with the larger facilities.

The People's Trust & Savings Bank of Laporte, Ind., has been appointed receiver of the Laporte Carriage Company. The plant will be continued in operation until present contracts are filled.

A steel tower 65 ft. high, supporting a wooden tank 18 ft. in diameter, at the plant of the Piel Bros. Starch Company, Indianapolis, collapsed and demolished the company's pumping and heating plant.

The Insley Mfg. Company, Indianapolis, Ind., maker of contractors' supplies, has bought five acres near the Belt road, on which it will erect a factory building to cost $15,000.

The Northern Indiana Gas & Electric Company, a subsidiary of the United Gas Company, will build a $1,000,000 power plant at the junction of the Indiana Harbor canal and the Calumet River for the cities of Hammond, East Chicago, Whiting, Ind., and about 20 smaller cities and towns.

The Star Upholstered Furniture Company, Anderson, Ind., has been incorporated with $10,000 capital stock to manufacture furniture. The directors are C. Mullinex, William White and C. Graham.

The Universal Wheel Company, Fort Wayne, Ind., has awarded the contract for the building of its new factory, which will include a machine shop, a woodworking shop, a general assembling shop, a blacksmith shop, a power house and auxiliary buildings. About 65,000 sq. ft. of floor space will be provided.

The Central South

LOUISVILLE, KY., November 26, 1912.

The season is almost at its hight in the distillers' equipment trade, as the producers are overhauling and renewing their plants in preparation for the busy season of the winter. Outside of this, comparatively little new business is being done, the principal activity being perhaps in the sale of small motors for farm use. Several concerns report a very fair and steady business in this item. Inquiries continue in good volume. Receipts of material from the mills are, as usual, extremely slow even in stock goods.

The James Clark, Jr., Electric Company, Louisville, was recently awarded the contract for supplying 27 three-phase, 60-cycle, 220-volt induction motors for the Hyde Park High School and the Nicholas Senn High School, Chicago, for use in the manual training departments of those institutions.

Thomas L. Barrett, dealer in contractors' machinery, Louisville, has sold to the Falls City Construction Company, Louisville, several hoisting machines and engines manufactured by the Clyde Iron Works.

J. F. Wagner's Sons, Louisville, manufacturers of fireproof metal building materials, have recently added to their equipment by the purchase and installation of two drill presses.

Henry Pilcher's Sons, Louisville, who conduct an organ manufacturing plant, intend to enlarge and modernize their factory in the spring, the principal improvement contemplated being the application of electric power throughout.

The Louisville Fire Brick Works is equipping a new plant for the manufacture of the company's products in Carter County, Ky. Most of the power equipment and machinery has been purchased.

The Henry Vogt Machine Company, Louisville, has contracted with the Clay Light & Ice Company, Clay, Ky., for the furnishing of a 10-ton ice plant to be used by the latter company, utilizing the exhaust steam from its present plant for power.

Contracts for the construction of the National Theater Building, Louisville, which will involve heating and lighting equipment and one electric elevator, will be let during the coming month at Louisville by Joseph & Joseph, the architects.

The Henry Vogt Machine Company, Louisville, has sold to the W. H. Gillette Mfg. Company, Louisville, manufacturers of wood, a 100-hp. boiler.

The Seelbach Hotel Company, Louisville, Ky., is planning the construction of a light and power plant to serve the hotel, the cost of which is estimated at $50,000. The present plant is inadequate for the needs of the original building and the annex.

Bids have been opened by the Building Committee of the Louisville Board of Education for a new motor and other equipment for the physics department of the Girls' High School, and the contract will be awarded shortly.

The plant of the Art Brass & Plating Company, 448 South Fifth street, Louisville, was damaged by fire to the amount of several thousand dollars. Vice-President Charles Rindt reports that no new machinery will be required, as the damaged equipment can be overhauled and repaired.

The cooperage plant of J. B. Speed & Co., cement manufacturers, at Nineteenth and Canal streets, Louisville, was damaged to the extent of $1,000 by a fire originating in the basement. No new machinery will be necessary.

In connection with the extension now under construction from Winchester, Ky., to Irvine, Ky., the

Louisville & Nashville Railroad Company will probably construct car shops at the latter point. The company's general offices are at Louisville.

The Elizabethtown, Ky., Electric Light Company's plant has been purchased by interests representing the Middle West Utilities Company of Chicago, which has recently acquired several public service plants in central Kentucky, including those at Winchester, Mt. Sterling, Lawrenceburg, Versailles, Somerset and Shelbyville. It is reported that still others are being negotiated for, after which the company will inaugurate extensive improvements, probably in the nature of central power houses to operate several plants. Among those handling the deals for the company are Harry R. Reid, Samuel Insull and Martin J. Insull, Chicago. The company intends immediate improvements in the Elizabethtown plant in order to give day power service in addition to the lighting service now given.

Corydon, Ky., is planning the issue of $8,000 worth of its bonds, recently voted for an electric lighting plant at that place. The plant will be contracted for as soon as the bonds are disposed of.

O. R. Hukle, Lexington, Ky., is to have charge of the new garage to be erected by C. H. Berryman in that city on East Main street, and a complete automobile repair shop will be installed.

Thomas F. Moore, Winchester, Ky., is making arrangements for the manufacture at that place on a large scale of a portable derrick invented by him.

Henry Ehret, Bristol, Va.-Tenn., will establish a boiler and sheet metal plant at Johnson City, Tenn., and is now in the market for the following machinery, either new or second hand, for its equipment: One set of bending rolls, belt driven, 8 to 10 ft. between housings to bend ½-in. plate; a belt-driven punch and shear; a 2-in. bolt cutter; an air compressor, about 8 x 8 in.; a flanging clamp, a drill press, a flue welding machine to take 2 to 4 in. flues, and a bevel shearing machine. Mr. Ehret was until recently president and general manager of the Twin City Boiler & Sheet Iron Works, Bristol.

W. W. Johnson, manager of the Tennessee Ice Company, Memphis, Tenn., will give information to machinery manufacturers with reference to a proposed new ice plant.

The Beare Bros. Ice & Coal Company, Jackson, Tenn., wants prices on electric motors and ice-conveying machinery for its plant at that place.

The Germania Cedar Works, Christiana, Tenn., will rebuild its pencil factory which was recently destroyed by fire with a loss of $50,000.

Birmingham

BIRMINGHAM, ALA., November 25, 1912.

Unusual activity in sawmill sections and a continuance of exploitation in mining regions account for a steady trade in machinery, pumps and engines. There has been no special change in several weeks. All dealers report satisfactory status.

The American Chemical & Agricultural Company, Montgomery, Ala., has purchased a large plot of ground presumably for the construction of a fertilizer factory.

The Young-Robertson Drug Company, Waycross, Ga., will enlarge its plant for the manufacture of medicines. Machinery for labeling and bottling will be installed. J. M. Young Jr., and H. K. Robertson.

Doerun, Ga., J. L. Dowling mayor, has voted $12,000 of bonds for electric lighting plant.

A movement has begun in Pensacola, Fla., for an election on the issuance of $100,000 of bonds for an electric lighting plant.

The Salvar Paint & Roofing Company of America, with headquarters at Bessemer, Ala., has been incorporated with a capital stock of $250,000 to establish a plant for the manufacture of Salvar products. Grey J. Huffman is president.

Some improvements will be made in the stove factory at Dalton, Ga., recently purchased by J. F. James and associates, of Chattanooga.

Robert Trechsel is president and J. E. Dunlop secretary of the Alabama Concrete Roof Tile Company, which has begun the construction of a plant in Birmingham, Ala., with a capacity of 25 squares a day.

The Tampa Tile & Ornamental Company, Tampa, Fla., has applied for a charter, with a capital stock of $20,000. It will manufacture concrete brick, tile, cement, artificial stone, etc. Emilio Sarrior is president.

The Hercules Plaster Board Company, Hampton, Va., is in the market for a 25-h.p. fire-box boiler.

The engine room and planing mill of the Carter Lumber Company, Meridian, Miss., were recently destroyed by fire with a loss of about $25,000. In the same fire the Standard Oil Company sustained a loss of about $15,000 by the partial destruction of its buildings.

The Singer Mfg. Company, Shreveport, La., is planning the erection of a large hardwood mill near Tallulah, La., for the development of 14,000 acres of timber lands which it owns near that town, and of large additional tracts which it intends purchasing.

The Commissioners of Public Works, Camden, S. C., will open bids December 19 for building the waterworks and electric light plant. The work will consist of auxiliary and main pump station to be equipped with steam and electric pumps, 300-hp. boiler, the erection of a 1,000,000 gal. filter plant and reservoir and a lighting plant equipped with generator and appurtenances complete.

The International Barrel Company, Savannah, Ga., has acquired the assets of the Truckers' Crate & Barrel Company, manufacturer of Robinson line of slack and ventilated barrel machinery. The company will establish a new plant at Savannah and is now in the market for its equipment. It is planning to erect other plants at various points in the South. William B. Stillwell, Savannah Bank & Trust Building, Savannah, is president.

The Dublin Fertilizer Company, Dublin, Ga., has been incorporated with a capital stock of $30,000 by W. S. Phillips, A. W. Garrett, W. B. Rice and others and will establish a fertilizer plant.

St. Louis

ST. LOUIS, MO., November 25, 1912.

The business tendency in the machine tool market while not striking is generally considered very satisfactory. The inquiries which are coming in are broadly spread and while they are mostly for single tools or small lists, the aggregate is indicative that there is no essential cessation of the general belief in a continuance of prosperous times. A decided increase during the latter part of the week in the inquiries added to encouragement. Second-hand tools are moving reasonably well. Collections are reported good.

Washington University, St. Louis, has taken out a permit for a $40,000 power plant building for its medical school group. The heating and power plants are to be combined.

Permits have been taken out for more of the buildings of the Barry-Wehmiller Machinery Company's new plant, to which the company will move as soon as the structures are completed and equipped. Much of the old equipment will be used, but it is stated that there will be considerable new machinery added.

The Southern Coal & Mining Company, East St. Louis, Ill., has been given a permit by the city to construct and equip a $50,000 coal washer near the east end of the municipal bridge. The equipment is to be modern in every way.

The Bemis Bros. Bag Company, St. Louis, has leased adjoining property for the construction of an addition to the manufacturing plant. It is stated that new equipment will be required for the new space which approximates 50,000 sq. ft.

The Hillside Mining Company of Ohio has been given permission by the State of Missouri to use $15,000 of its capital in equipping a plant on its mining property in the Joplin district.

The Midwest Electric & Sign Company, Kansas City, Mo., has been incorporated with $10,000 capital stock by L. A. Thomas, M. R. and H. M. Green and F. W. and G. E. Thomas to manufacture electric signs, etc.

The Mound City Light & Water Company, Mound City, Ill., has been incorporated with $100,000 capital stock by H. E. Chubbuck, of Peoria; W. R. Carnahan, W. J. Achelpohl, E. W. Fowler and W. H. Creviston, all of the McKinley Traction System, to take over and improve the public service plant at Mound City, Ill.

The Conrades Mfg. Company, St. Louis, has been incorporated with $10,000 capital stock by E. H. and J. H. Conrades and William F. Baumann to equip a plant for the manufacture of furniture and to do all kinds of woodwork and millwork.

The Hachmann Specialty Company, St. Louis, has been incorporated with $25,000 capital stock by John E. Earenfight, John W. Menaugh and A. A. Eicks with plans for the equipment of a plant for the manufacture of bottle stoppers, flask caps, lamp burners and other similar metal goods.

The Lovejoy Planing Mill Company, Kansas City, Mo., has been incorporated with $20,000 capital stock by C. E. Lovejoy, Thomas W. Nelson and C. E. Lovejoy with plans for the equipment of a planing mill.

The National Gas Generator Company, Kansas City, Mo., with $50,000 capital stock, has been incorporated by Lewis Alversen and Charles and C. E. Andrews to equip a plant for the manufacture of a new gas appliance.

The Southwestern Blaugas Company, Kansas City, Mo., with $200,000 capital stock, has been incorporated by Theodore Gary, C. S. Gleed, W. F. Rankin and others, with plans for the immediate equipment of a plant.

The Otis Mining Company, Joplin, Mo., has been incorporated with $20,000 capital stock by Harvey H. and A. W. Lord and Otis W. White to equip and operate mining land controlled by them.

The Coal Valley Light & Power Company, Rock Island, Ill., has been incorporated by E. E. and H. M. Walsh and Paul Wagner. Its plans as to plant, etc., have not been given out.

The equipment of the St. Joseph Railway, Light & Power Company, St. Joseph, Mo., it is announced, is to be increased by the addition of turbine engines and boilers at a cost of about $100,000, adding 50 per cent. to the output of the plant.

The Pittsburgh Oil Company, Tulsa, Okla., has been incorporated with $25,000 capital stock by Thomas and B. M. Gilcrease and R. I. Wilson to equip and develop property owned by them.

The Cushing Electric & Power Company, Cushing, Okla., with $15,000 capital stock, has been incorporated by F. M. Overlees, J. W. Pollard and H. Askin, all of Bartlesville, Okla., with plans for the immediate construction of a public service plant.

An addition to the plant of the Wayne Mfg. Company, St. Louis, manufacturer of washing machines, is announced, together with plans for new equipment in the addition.

A waterworks plant is to be installed at Duke, Okla., if the town authorities can make suitable arrangements with a company engaged in providing plants for small towns.

Fire at New Orleans, La., recently burned the Globe Packing Box Company's plant with a loss of $60,000. It is stated that it will be rebuilt and new equipment purchased.

The Sterling Oil, Gas & Development Company, Sterling, Okla., with $50,000 capital stock, has been incorporated by O. E. Winn and others. Its plans are unannounced.

The Dewey Gas Company, Dewey, Okla., with $50,000 capital stock, has been incorporated to obtain machinery and develop property controlled by J. A. Bartles, D. R. Low and N. M. Bartles.

It is stated that a 500-ton concentrating mill will be equipped in the Porto Rico mining field in the Joplin, Mo., district by James Brown, electric power being utilized.

Bids will be received at Fairfield. Ill., until November 29 for the equipment of a waterworks and electric light and power plant for the municipality. The engineers are the Fuller-Coult Company, St. Louis, and the plant will be of 150 k.v.a. power, 2300-volt alternating, with all necessary steam and electrical equipment.

The Sano Mfg. Company, St. Louis, has been incorporated with $20,000 capital stock by Adolph H. Schmedtje, Alfred T. Anderson and Henry W. Kroeger to manufacture boxes, cases, etc., of metal, wood, etc., for merchandise.

The Bates Coal Mining & Mercantile Company, Rich Hill, Mo., has been incorporated by S. B. Barr, M. E. Fullbright, Homer Humphrey and others to mine coal in that vicinity.

The Fisher Machine Works, Leavenworth, Kan., whose foundry was damaged to a considerable extent by fire, is rebuilding.

The Missouri & North Arkansas Railroad, by its directors and receivers, J. M. McDonald and W. S. Holt, has made a contract providing for the location of new shops at Harrison, Ark., for which an expenditure of $125,000 is contemplated.

Texas

AUSTIN, TEXAS, November 23, 1912.

The demand for various lines of machinery and tools continues active, and almost daily new projects that involve the installation of considerable machinery come to light.

The Wichita Falls Glazing Company, Wichita Falls, will establish a plant for the manufacture of window sash.

F. A. Price, Youngstown, Texas, and associates will soon complete the work of installing a gas manufacturing plant and laying a distributing system at Taylor.

The Board of Water Commissioners of Waco has awarded the contract for the installation of a water filtration plant at that place to the Pittsburgh Filter Company, Pittsburgh, Pa., at a cost of about $85,000.

Preliminary surveys for the proposed irrigation district that is to be created near Ballinger, have been finished. It is planned to build a dam across the Colorado River and form a large storage reservoir sufficient to irrigate 129,000 acres of land. The cost of the dam and other works connected with the project will be financed by a bond issue that will be placed upon the district.

The Young Men's Business Association of Gainesville, Texas, is negotiating for the establishment there of a large awning and mattress factory.

The Atascosa Valley Irrigation Company is preparing to construct a large system of irrigation near Coughran. William Dunn is chief engineer.

The Continental Gin Company will erect a new foundry at its plant at Dallas to replace the one which was destroyed by fire recently. The new foundry will be considerably larger than the old one.

The Port Arthur Light & Power Company which was recently organized at Port Arthur, with a capital stock of $600,000, has taken over the electric light and power plant of the Port Arthur Traction Company. It is stated that the new company will also provide power for the operation of the interurban electric line which is to be constructed between Port Arthur and Beaumont, 25 miles.

The Ehlers Engineering Company is making a survey for the proposed sewer system that is to be constructed at Elgin, by the city.

It is reported that the Mexico Fuel Oil Company, which is preparing to establish a line of oil carrying vessels between Tampico, Mexico, and Freeport, Texas, will install a large oil refinery at the latter place.

The Alamo Oil & Refining Company will soon begin the erection of a new cotton seed oil mill at San Antonio to take the place of the plant that was recently destroyed by fire. The new mill will cost about $50,000.

The Victoria Mfg. Company will double the capacity of its electric light and power plant and will also enlarge its ice manufacturing plant at Victoria. A steel turbine and an electric generator of 500 kw. capacity will be added to the equipment of the electric light plant. The proposed improvements of the company will cost about $40,000.

The Louisiana Traction & Power Company, Lafayette, La., has been organized with a capital stock of $250,000. Its purpose is to construct a system of interurban electric railroads and to supply light, heat and power. J. A. Landry is president; S. T. Woodring, first vice-president; T. J. Bird, second vice-president, and D. J. Landry, treasurer. P. O. Moss is secretary.

The Fitz Oil Company, Galveston, has been organized for the purpose of operating in Texas oil fields. The incorporators are J. M. Smith, L. H. Fellman and A. Q. Peterson, all of Galveston.

The Abilene Gas & Electric Company has been organized at Abilene, with a capital stock of $275,000 for the purpose of installing and operating an electric light and power plant and the construction and operation of electric lines. The incorporators are E. T. Thomas, D. Dellis and Glenn A. Smith, all of Abilene. The same men are also the incorporators of the Abilene Water Company which has just been organized with a capital stock of $200,000 and the Taylor County Ice Company which has a capital stock of $140,000.

The Pacific Coast

SAN FRANCISCO, CAL., November 19, 1912.

Orders are reported on the Western Pacific list, the bulk of the business going to Harron, Rickard & McCone. Aside from this there is a noticeable scarcity of orders or new inquiries involving large investment, and some dealers appear dissatisfied with conditions, saying that price is the ruling consideration with all buyers of machine tools in this territory. There is also some divergence of opinion as to prospects for the coming year, though most underlying industries of the district are in good shape. A prominent feature of the machine tool business is the garage trade. An unusually large number of garages have been installed in the last two months, practically all these establishments putting in a lathe, planer and drill press, while many are ordering larger outfits. In many cases, however, the tools are paid for in small instalments.

Woodworking machinery remains quiet, though many mill owners through the country are planning improvements during the winter. Other classes of

equipment continue in good demand for this season, and considerable attention is given to special equipment for various industries. Orders are still coming out for electrical machinery, and the outlook for road-building machinery is good, as numerous counties and towns are taking up the good roads movement. Local manufacturers are getting heavy orders for marine gas engines for the northern fisheries, as well as for export, though cheap electric power is interfering with the sale of stationary engines.

Traveling salesmen report considerable activity in the Arizona mining and smelting industry. The United Verde Copper Company, Jerome, Ariz., contemplates the removal of its smelter from that place to Clarksville, which will soon have a new railroad connection. Several successful oil wells have been sunk in that district and the product is said to have a paraffin base.

B. J. Smith, agent for several machine tool manufacturers, has moved his headquarters from 219 Spear street to 3 First street.

The American Beet Sugar Company, Chino, Cal., has ordered a 20 in. x 12-ft. lathe.

The owners of the Colman Dock, Seattle, Wash., have placed an order for a 5-ton Shaw crane, 80-ft. span, for handling piles in their creosoting plant.

The Eccles & Smith Company, 77 First street, this city, handling machine tools and railway equipment, is taking on additional space for stock and display purposes.

Various reports are coming from Los Angeles and Seattle, Wash., concerning new steel manufacturing projects, but no information regarding them is available here, and the reports have the appearance at least of exaggeration. According to the latest Seattle rumor a number of foreign capitalists headed by C. W. French have been looking over the ground with a view to establishing a steel plant.

It is reported that the Pacific Electric Railway has plans under way for a shop at San Bernardino, Cal.

E. A. Washburn is preparing to install a shop at San Simon, Ariz., for work connected with well drilling.

The city of San Diego, Cal., has just opened bids for a dredge to be operated by electricity.

A large portion of the California Paper & Board Mills, Antioch, Cal., was destroyed by fire November 12, the loss including much new machinery. The equipment will be replaced as soon as possible.

Officials of the Yosemite Lumber Company announce that a sash and door factory will be installed shortly at Mercer, Cal.

The Simons Brick Company, Los Angeles, is installing a lot of new machinery.

New machinery is being installed at the Hemet, Cal., gas plant, and the distributing system is to be extended.

The city of Alameda, Cal., has let contracts for the equipment of its new electric plant, the turbine unit going to Hunt, Mirk & Co. at $44,494, switchboards and regulators to the General Electric Company at $17,225, and boilers and oil tanks to C. C. Moore & Co. at $29,473.

The Consumers Ice Company is preparing to install a plant at Porterville, Cal.

The Union Ice Company is starting work on its second plant at San Diego, Cal.

The Nevada Wonder Mining Company, Wonder, Nev., is planning to install a large electric hoist.

The town of Salinas, Cal., is considering the installation of a rock crusher.

The Railway Equipment Company, Portland, Ore., has leased the entire building at First and Oak streets, that city. In *The Iron Age* of November 7 it was erroneously stated as being in Seattle.

Eastern Canada

TORONTO, ONT., November 23, 1912.

The autumn has done much to atone for the summer, and the too copious and frequent rains of the latter are forgotten in the presence of the wonderfully fine season the country is now experiencing. The rains of summer did not cause any perceptible check in manufacturing activity. It is hard to imagine what the manufacturers would have done had the summer been as ideal as the autumn is, for that would have meant a greatly intensified demand, and there were not hands to respond to a larger demand than that actually served. The good weather has favored the grain movement, and there is little of the congestion that was expected. In the face of the winter the plants of manufacturers are almost as busy as they could be.

The Maritime Motor Car Company has its factory at Coldbrook, N. B., far advanced toward completion.

The Canadian Locomotive Company, Kingston, Ont., is carrying out its large programme of enlargement and additional equipment, and has still heavy expenditures to make on these accounts.

By-laws are to be submitted to the ratepayers of Toronto January 1 to raise $13,000,000 to carry out public improvements, notably a new waterworks system to cost $6,000,000.

G. E. Lindsey, Toronto, has obtained a lease of land in Toronto's industrial district. He proposes to establish a large interior woodwork factory.

In the fire which destroyed the Superior Oil Company's building at Sault Ste. Marie, Ont., November 20, there was consumed $12,000 worth of the company's stock, besides $10,000 worth of patterns belonging to the Alpena Iron Works.

On November 22 the ratepayers of Wharton, Ont., approved by-laws embodying municipal agreements with the Rubber Company, the Knitting Company and a flour manufacturer, all of whom will erect works there.

The Eureka Company proposes to erect a large watch factory at Port Arthur, Ont.

John Taylor, of the Taylor Milling Company, Lethbridge, Alberta, offers to erect there as fine a flour mill as the Ogilvie Company is putting up at Medicine Hat if municipal concessions are granted.

The Berlin Fibre Products Company has been organized to do business in Berlin, Ont.

The Beaver Company, Buffalo, William F. MacGlashan, president, manufacturer of Beaver board for interior wall covering for the building trade, has purchased a site of 30 acres in Thorold township adjoining Welland, Ont., where it will locate a large plant. The company will utilize a byproduct of the paper mill recently established in Welland.

It is stated the Canadian Pacific Railway Company is planning to erect car shops at Toronto which will cost about $500,000.

The Wilt Twist Drill Company of Canada, Ltd., Walkerville, Ont., has filed incorporation papers with a capital stock of $150,000 and will engage in the manufacture of machinery and tools, engines and mechanical and electrical supplies. Hiram H. Walker, Hobart A. Springle, Sidney C. Robinson, Walter Cleater and Edgar F. Ladore are the directors.

The Bateman-Wilkinson Company, Ltd., Toronto, has been incorporated with an authorized capital stock of $500,000 for the purpose of engaging in the manufacture of agricultural machinery and railroad and contractors' supplies. James H. Spence, James Russell, Lovett Starr, Matthew C. Cameron and James Aitchison are among the incorporators.

The Fischer Machinery Company, Ltd., Hanover, Ont., has been incorporated with a capital stock of $50,000 and will build a foundry and machine shop and manufacture and deal in machinery. William H. Fisher, Arthur W. Fisher, Daniel and Jacob S. Knechtel, Henry Peppler, B. F. Ahrens and others are the incorporators.

The Town Council, Welland Ont., has authorized the Hydroelectric Commission to prepare plans for the construction of a municipal electric light plant, estimated cost $95,000.

The Christie-Brown Company, Toronto, is having plans prepared for an extensive addition to be made to its manufacturing plant.

Western Canada

WINNIPEG, MAN., November 22, 1912.

The local machinery houses this week report the volume of business fair. No very big contracts have come forward, although there are some good prospects. Quite a few orders for machinery parts have been received. These the different firms are able to handle from their warehouses with dispatch, but there is some complaint regarding the delivery of freight at this time of the year. Small shipment freight is said to be moving very slowly, owing to the general congestion consequent upon the very heavy carrying of grain. The outlook for next season continues satisfactory.

Charles Crary, representing the Medicine Hat Pump & Brass Mfg. Company, Ltd., has entered into an agreement with the City Council of Medicine Hat, Alberta, to establish a plant there to cost about $50,000. The company will manufacture pumps, windmills and all kinds of brass goods.

The city of Moose Jaw, Sask., which is now replacing the power plant which burned some time ago, is figuring on enlarging the capacity of the works in the near future, on account of the rapidly increasing demand for power.

It is announced that the Emerson-Brantingham Mfg. Company, manufacturer of agricultural machinery, Rockford, Ill., will establish a branch at Brandon, Man., shortly.

It is reported that the Dominion Match Factory, New Westminster, B. C., will erect a big manufacturing plant at Port Arthur, with a capacity of 30,000,000 matches per day. Edward Stewart, a representative of the company, has been making arrangements to that effect.

The authorities of the town of Rosthern, Sask., have decided to recommend the expenditure of $250,000 on waterworks and lighting system.

The town of Hanley, Sask., will install a lighting system at a cost of about $11,000. The clerk is A. Holm.

The town of Wadena, Sask., has under consideration the installation of a lighting system at a cost of about $20,000.

The Prince Rupert Hydroelectric Company, Prince Rupert, B. C., contemplates the building of a big power plant. The manager is M. F. Clarke Durant.

The Presto Heater Company of Alberta, Ltd., Edmonton, Alberta, has acquired a building site on the outskirts of that city upon which a factory for the manufacture of a hot-water and steam heater will be built at a cost of $50,000. Construction will be started in the early spring. A modern machine shop will be included in the plant. P. E. Lessard is president; W. A. Aubin, vice-president, and J. E. Bertrand, secretary-treasurer. These officers with A. Boileau and J. W. Mould are the directors.

The Canadian Northern Railway Company is credited with the purpose of building large car shops in Moose Jaw, Sask.

J. Bruitnel, who is at the head of the company negotiating for the establishing of a nail factory in Port Arthur, Ont., gives notice to the City Council there that its conditions are satisfactory.

The Canada Standard Automobile & Tractor Engine Company is having plans prepared for a large factory at Moose Jaw, Sask.

The Nanaimo Navigation Company, Nanaimo, B. C., formed some months ago to build vessels, is preparing to establish its works.

Government Purchases

WASHINGTON, D. C., November 25, 1912.

The Paymaster General, Navy Department, Washington, will open bids November 26, under schedule 4933, class 61, for one planing machine 54 x 54 in x 10 ft., two horizontal boring, drilling and milling machines and six reversible and 26 non-reversible drilling machines; schedule 2934, class 64, for three 1-hp., 110 to 115- volt direct-current shunt wound non-reversible motors and one 10-hp. direct-current non-reversible motor.

The Paymaster General, Navy Department, Washington, will open bids December 3, under schedule 4910, class 1, for one centrifugal pump; schedule 4949, class 41, for one pattern maker's disk grinder; class 61, 120-in. motor-driven crankshaft lathe, and on December 10, under schedule 4967, for one electric locomotive and one positive pressure blower.

The Isthmian Canal Commission, Washington, opened bids November 14, under canal circular 741, class 1, for one cylindrical return tubular boiler as follows: Bidder 36, William Cramp & Son Ship & Engine Building Company, Philadelphia, Pa., $6,995; 44, P. Delany & Co., New York, $8,350; 59, A. D. Granger Company, New York, $7,943.

The United States Reclamation Service, Los Angeles, Cal., opened bids November 13 for furnishing high-pressure gates for the Arrowrock dam, Boise project, Idaho, as follows:

Pelton Water Wheel Company, San Francisco, Cal., $45,823; Joshua Hendy Iron Works, San Francisco, Cal., $41,489; Union Iron Works, San Francisco, $33,750; Walker Mfg. Company, Denver, Colo., $31,320; Hinman Hydraulic Mfg. Company, Denver, $30,916; Steacy-Schmidt Company, York, Pa., $27,000; Wheeling Mold & Foundry Company, Wheeling, W. Va., $26,100; Bethlehem Steel Company, South Bethlehem, Pa., $33,544.50; Coffin Valve Company, Boston, Mass., $31,125; Otis Elevator Company, New York, $39,475; Fulton Iron Works, Los Angeles, Cal., $38,419.

The Standard Chain Company, York, Pa., has placed a contract with the York Bridge Company for a steel frame building, 93 x 170 ft., with brick walls, to be used as a forge shop and machine room. The power plant, warehouse and stock room remain as they were, as these buildings were not seriously damaged when a fire crippled the plant two years ago. It is expected that the new building will be completed early in February.

Customs Decisions

Iron Melting Pots

The Board of United States General Appraisers has taken unfavorable action on protests by the Roessler & Hasslacher Chemical Company regarding the classification of wrought iron tanks, cylindrical in form, with rounded bottoms and weighing over a ton each. In use the articles are melting pots or crucibles. Duty was assessed at the rate of 45 per cent. ad valorem under paragraph 199 of the present law, as "manufactures of metal not specially provided for." The merchandise was claimed by the importer to be subject to duty at 30 per cent. under paragraph 151, as "cylindrical or tubular tanks or vessels." Judge Fischer, in the decision for the board, says that the melting pots in question do not belong to the class of holders of substances enumerated in the paragraph for cylindrical tanks or vessels. The collector's classification will stand. It is understood the importer will appeal this case to the Court of Customs Appeals at Washington.

Sewing Machines

In sustaining a protest by P. C. Kuyper & Co. and others, the board adheres to its rule to give a broad interpretation to the provision in the tariff act of 1909 for "sewing machines." The machines in controversy consisted of apparatus for sewing or stitching together of the open ends of hosiery, and for the seaming up of selvage goods. The customs authorities alleged that the term "sewing machine" as appearing in the tariff was restricted to the household article of that name. Accordingly, duty was exacted at 45 per cent. as "manufactures of metal, not specially provided for." The board upholds the importers' contention that the machines are entitled to enter at 30 per cent. under paragraph 197, as "sewing machines."

Powdered Iron Ore

The board has overruled a protest by J. W. Coulston & Co. regarding the classification of oxide of iron or hematite iron ore imported in a powdered condition. It was assessed at 10 per cent. ad valorem under paragraph 56 of the tariff act of 1909, as a paint or pigment. The importers asked for a tax of 15c. a ton as iron ore under paragraph 117. The collector is affirmed.

Single Cylinder Bar Hoists

The board has sustained a protest filed by Hensel, Bruckmann & Lorbacher relating to the classification of single cylinder bar hoists. They were returned for duty by the collector at New York at the rate of 45 per cent. ad valorem under paragraph 199, as manufactures of metal. The importers claimed the machines dutiable at 30 per cent. under the provision in the law for "engines." The collector is reversed.

Metal Dials for Sewing Machines

It has been decided by the board that metal dials used as parts of sewing machines are not dutiable at 30 per cent. ad valorem under the provision in the tariff law for "sewing machines." The collector at New York classified the dials as "manufactures of metals not specially provided for" with duty at 45 per cent. The board affirms this action.

Clip Plates

The board sustained a claim by Joseph Blank and the Ernst Wiener Company asking that steel clip plates be allowed to enter at 30 per cent. ad valorem under paragraph 123, as forgings. The collector's assessment at 45 per cent. under the metal schedule as manufactures not provided for is reversed.

The recent notification of the Standard Oil Company of Indiana to Central Western manufacturers that it would not be in position to sell fuel oil after January 1 affects a considerable number of establishments in Detroit, particularly automobile factories. Practically all of the extensive installations of furnaces for the treatment of steel in these plants burn fuel oil. In many cases these furnaces are now crowded into a floor space which cannot be made to accommodate coal-burning furnaces, and a resort to gas would be expensive in operation and, in many cases, in installation.

New Tools and Appliances

This is essentially a news department for which information is invited

Quick-Change Gear Lathe.—The Overkamp Machine & Tool Company, Dayton, Ohio, has recently added a new quick-change gear lathe to its line. This tool is built with 14 and 16-in. swings and with either a five-step cone pulley and a single back-geared headstock or a large three-step cone pulley and a friction double back gear. The machine is ordinarily furnished with a quick-change gear box which provides for 32 feed changes with but two operating levers and if desired it can be supplied with an all geared feed box or a belt feed box, these last two being independent and interchangeable.

Asbestos Brake Lining.—An asbestos brake lining which is made from high-grade long fiber asbestos woven in a yarn with two strands of soft brass wire as a core is being supplied by the Royal Equipment Company, Bridgeport, Conn., in the various widths and thicknesses required by the trade. The new lining, which is known as Raybestos, is said to be capable of withstanding a combination of heat, oil and grease for a long time and maintaining an even coefficient of friction until it is entirely worn out. It is pointed out that there are no strands to become frayed or worn and no outer layer or covering to become loose as the facing is made as a unit and wears as one. It can be cut, drilled or countersunk the same as wood or fiber.

Square Can Seaming Machine.—For square, oval and oblong work, a double seaming machine, which is entirely automatic in its operation, has been brought out by the E. W. Bliss Company, 11 Adams street, Brooklyn, N. Y. It will seam cans ranging from ¾ to 5½ in. in hight and the rate of production varies from 12,000 to 20,000 cans in a 10-hr. day according to the size of the can and the expertness of the operator. An automatic friction clutch, incased in a two-step cone pulley, drives the machine and there is a hand-brake on the end of the driving shaft which automatically engages and releases after the work is done, thus insuring the stopping of the spindle in exactly the same position after each cycle. The lower spindle is positively driven and will stop and start in unison with the upper one, thus giving a straight body after double seaming. When the clutch is thrown into engagement by pressing the treadle, the driving shaft, which is connected to the chuck spindle by bevel gears, is started and the two double seaming rolls are brought into action. The can is revolved the required number of times, and after the double seamer rolls have gone through their motions they are retired. At this time the clutch is disengaged and the chuck is stopped, the lower plate dropping and releasing the can.

Adjustable Wrench.—The Bemis & Call Hardware & Tool Company, Springfield, Mass., has recently designed a new type of quick adjustable wrench. The jaws are offset 22 deg. from the handle and their adjustment is controlled by a small worm. Malleable iron is used for the frame and the movable jaw is a steel drop forging.

Heavy Six-Spindle Milling Machine.—What is claimed to be the largest special purpose milling machine ever built is a five-head six-spindle one especially designed for the milling of gas tractor engine frames by the Ingersoll Milling Machine Company, Rockford, Ill. The construction of the bed and table is of the ordinary planer type and the wings to carry the housings are cast integral with the bed, the housings and cross-rail being also cast in one piece. Three of the heads are horizontal, have a counterbalance and are arranged so that they may be raised or lowered either simultaneously or independently. The main spindle is of the face plate drive type and is arranged to carry cutters ranging from 24 to 36 in. in diameter. A 4½-in. spindle with an in-and-out adjustment runs through the center of the main spindle for driving smaller cutters.

Upright Drilling Machines.—Two upright drilling machines, one with and the other without a sliding head, have been brought out by the Richards Machine Company, Milwaukee, Wis. The stationary machine is regularly equipped with back gears, power feed and a combined wheel and lever feed, but if desired both the back gears and the power feed can be omitted and a plain lever feed substituted for the combined wheel and lever arrangement. When it is desired to use the wheel or lever feed, the power feed is disengaged by a device consisting of an arm carrying the bevel gear worm and wormshaft, which is operated by an eccentric for disengaging the bevel driving gears. There are eight changes of spindle speed and 24 feed changes available. The back gears for the low speed are inclosed in the upper cone pulley and the power for the automatic feed is obtained from the upper cone pulley spindle and is transmitted to the drill spindle by a belt connection and worm and bevel gearing. The sliding head machine is back geared and has a positive feed. The feed-changing device consists of two levers located directly below the gear box and operating a sliding gear for changing the rate, the levers being located by a notched plate with which they engage. One of the levers provides for three changes ranging from 0.003 to 0.011 in. per revolution of the spindle and this is increased to from 0.023 to 0.095 in. by manipulating the other lever.

Geared Double Facing Head.—For use with its horizontal boring machine, which was illustrated in *The Iron Age*, June 27, 1912, the Rochester Boring Machine Company, Rochester, N. Y., has recently developed a geared double facing head. The face plate on the head of the machine is geared to run slower than the boring bar and independently of it so that facing can be done while the hole is being bored. The facing head on the outer support is also geared and runs slower than the boring bar. It is driven by an extension of the boring bar through gears in the back of the column, thus giving a positive drive.

Automatic Valve Grinder.—For grinding the valves of gasoline engines so that they are evenly ground and accurately seated, the Specialty Machine Company, 95 Liberty street, New York City, has brought out an automatic valve grinder. The valve is rotated in opposite directions in its seat and is progressively advanced periodically in one direction. The valve is first reciprocated on its seat a certain number of times, is lifted and when released is placed in a different angular position, after which it is automatically moved forward through a given angle and again reciprocated.

Boltless Flask and Flask Bar.—For making up and baring any size of flask from 24 in. square upward, advancing in width and length by steps of 6 in., John Tuohy, Pittsburgh, Cal., has patented an interchangeable boltless flask and flask bar. These changes are accomplished by employing flask sides and ends of varying lengths which have sockets, the whole being held together by simple wedges, while the bars are secured by double finger wedges. It is emphasized that the flask and bars in place are as rigid as those of the bolted construction and will not shake loose. The bars can be raised or lowered in the flask to suit the pattern and can be placed either longitudinally or transversely while short ones can be inserted between the larger ones if desired. A reduction in the amount of labor and material employed in the flask shop of from 60 to 75 per cent. is claimed and the bars are applicable to regular wooden flask equipment, it being only necessary to cut oval holes in the sides for the finger wedges. No bolts or rivets are employed in the flask and a common hammer is the only tool required to assemble the parts or to knock them down.

Manually Operated Fire Pump Starter Panel.—To meet the requirements of the Associated Factory Mutual Fire Insurance Companies, which differ slightly from those of the National Board of Fire Underwriters, the Cutler-Hammer Mfg. Company, Milwaukee, Wis., has designed a duplex panel for the manual starting of two 125-hp. 220-volt fire pump motors. In general construction this panel is the same as the one described in *The Iron Age*, March 21, 1912, with the exception that the earlier panel which was built to conform to the requirements of the Chicago Board of Fire Underwriters was arranged for both automatic and manual starting. This new panel when installed will be inclosed in a splash-proof ventilated case with doors and a removable back and the bottom of the board is 2 ft. above the floor. There are no fuses in the operating circuits, although automatic and overload releasing devices are provided. In the design of this panel fibre has been excluded altogether. There are no iron to iron bearings

and all steel parts are either finished by copper plating or enameling. The operation is of the single lever type with butt accelerating contacts, seven being mounted on each panel. A pilot switch is placed above the meter, which is used to indicate the voltage of the supply line. The resistance, which is inclosed, is mounted on the back of the panel and the connections, terminals, etc., are of more liberal capacity than are found on the control panels used for other purposes.

Bench Filing Machine and Bench Lathe.—The B. C. Ames Company, Waltham, Mass., has recently modified the design of its bench filing machine by the addition of a countershaft to carry the belt out of the way of the operator and the form of the graduated swivel under the table which is used for securing the angular setting has been changed. An ordinary countershaft is used and the belt running around the bench countershaft passes over the pulleys on this one. This machine is built in several sizes, the smallest having a 4-in. file and a stroke of 1½ in. If desired a diamond lap can be substituted for the file, which is mounted in a saw frame and is reciprocated by a pitman. The bench lathe has a very large headstock spindle, which will accommodate work up to a maximum diameter of 2½ in. and is intended for handling work made from tubular stock or other light pieces. A lever chuck closer is provided so that the chuck can be operated for releasing the stock with the spindle in motion.

Motor-Driven Broaching Machine.—The J. N. Lapointe Company, New London, Conn., has developed a machine with motor drive for broaching small-sized holes of different shapes. The machine, the motor and the rear countershaft bracket are all mounted upon the one base, while the front bracket upon which the motor switch is located is fastened to the machine, thus giving great rigidity. The pressure from the screw is taken by a large ball thrust bearing and the countershaft has ball bearings. The cutting speed of the machine is 7 ft. per minute and it will cut ⅜-in. keyways or broach holes ¾ in. square.

Hollow Set Screw.—A new type of hollow set screw which does not require a special wrench is being manufactured by the Goodwin Hollow Set Screw Company, Waterbury, Conn. This screw is made in a variety of sizes and has six dovetailed slots so that it is possible to set it up tightly with a common screw driver or a piece of flat metal about the width of the slot. This arrangement also is an advantage when it is not possible to secure much movement for the means employed for tightening.

Trade Publications

Drill Chucks.—Automatic Drill Chuck Company, 91 Wall street, New York City. Circular. Deals with the Emrick automatic grip and release drill chucks for straight shank drills. The special features claimed for this chuck are the elimination of trouble in drilling, there being no keys, no jaws and no stoppage of the drilling machine, ease of inspecting the drill, adaptability of the chuck for high speed drilling and the possession of unlimited holding power.

Automatic Screw Machines and Their Products.—National-Acme Mfg. Company, Cleveland, Ohio. Calendar. Size, 12 x 15 in. The calendar is of the loose-leaf variety, a separate leaf being devoted to each month. The general arrangement is the same as that of the calendars previously issued by the company, the year beginning on November 1 and the leaf for each month containing an illustration of one of the screw machines built by this company or some of its products. A change has however, been made in the typographical appearance, the engravings being of a much better order and being printed in white on black.

Blow-Off Valves.—Eynon-Evans Mfg. Company, Fifteenth and Clearfield streets, Philadelphia, Pa. Circular. Calls attention to a type of blow-off valve which is kept perfectly tight by packing and can be adjusted while the valve is in service in the same way as any ordinary stuffing box around a valve stem. The packing is absolutely protected regardless of the position of the valve and can be removed from the body for inspection while the valve is under full boiler pressure.

Gasoline-Electric Generating Sets.—B. F. Sturtevant Company, Hyde Park, Mass. Catalogue No. 205. Treats of a gasoline-electric generating set which is designed for use wherever an independent electric plant is desirable. The set consists of a multicylinder gas engine direct-connected to an electric generator, the former having a very sensitive governing mechanism which makes the use of storage batteries unnecessary. Other advantages claimed for these sets are the doing away with any special foundation, ease of installation and simplicity of operation and maintenance. An illustrated description of this set appeared in *The Iron Age*, October 24, 1912.

Semi-Automatic Furnaces.—W. S. Rockwell Company, 50 Church street, New York City. Catalogue No. 16. Deals with a line of semi-automatic furnaces for annealing, hardening, tempering, heat treating and miscellaneous operations. These furnaces are designed for handling a wide variety of material of irregular shapes and sizes in either aluminum, brass, copper, German and sterling silver, steel, etc. A brief description of the furnace is given, the text being supplemented by a number of halftone engravings.

Portsmouth Iron.—Portsmouth Steel Company, Portsmouth, Ohio. Handsomely illustrated booklet. Special attention is directed to the fact that its latest production, Portsmouth Iron, is made from No. 1 pig iron and select scrap of known analysis. Under the special process of manufacture employed, it is claimed that the final result is a soft, ductile, homogeneous metal, practically free from all impurities.

Forged Steel Valves and Fittings.—Henry Vogt Machine Company, Tenth and Ormsby streets, Louisville, Ky. Bulletin F-1. Deals with a line of valves and fittings for ammonia, steam and hydraulic work which are forged from a special grade of billets. All the fittings are bored out of solid forgings and are tapped and threaded. If desired, these fittings can be tightened up without sweating and soldering, but if desired, this can also be done. The various fittings which include steel, ells, tees, valves and flanges are illustrated with tables of the different sizes they are made.

Cranes and Trolleys.—Samuel W. Hay's Sons, 1406-9 Keenan Building, Pittsburgh, Pa. Two catalogues. One illustrates different classes of foundry equipment, including cranes of pendant type (floor and cage control), ladles, tumblers, air hoists, cupolas, etc. The other covers overhead trolley systems, including track, trolleys, switches, turntables, etc.

Counting Machines.—W. N. Durant Company, Milwaukee, Wis. Pamphlet. Concerned with various types of counting machines made which include revolution, can, lineal measure and hand tally counters. One of these counters which not only gives a total record but also one for short runs was illustrated in *The Iron Age*, May 2, 1912.

Iron Cement.—Smooth-On Mfg. Company, 572 Communipaw avenue, Jersey City, N. J. Instruction book No. 7. Deals with the Smooth-On iron cement No. 7, which is an hydraulic chemical iron cement used for waterproofing, stopping leaks in concrete, hardening concrete and for binding concrete to concrete and brick to brick or any porous substance. There are a number of illustrations showing a few of the many ways in which the cement has been used and the results obtained.

Steel Pipe.—National Tube Company, Frick Building, Pittsburgh, Pa. Bulletin No. 11. Calls attention to the Spellerizing process which is a special method of treating the metal of which the pipe is composed. This consists of subjecting the heated bloom to the action of rolls having irregularly shaped projections on the working surface and then subjecting the bloom while still hot to the action of a smooth-faced roll, the operation being repeated to work the surface of the metal to produce a uniform, dense texture which is better adapted to resist corrosion and pitting. This process is applicable to sizes of pipe 4 in. in diameter and smaller. Mention is also made of the way in which the pipe of this company is marked by rolling the word "National" at regular intervals on all lengths.

Motor-Driven Lathe.—Lodge & Shipley Machine Tool Company, Cincinnati, Ohio. Circular. Describes and illustrates a 36-in. motor-driven standard screw cutting lathe. The construction of the lathe is briefly touched upon, and there is quite an extended table of specifications. An illustrated description of this lathe appeared in *The Iron Age*, September 19, 1912.

Hydraulic Turbines.—Allis-Chalmers Company, Milwaukee, Wis. Bulletin No. 1628. Illustrates several types of horizontal open flume hydraulic turbines which are made with runners ranging from 14 to 80 in. in diameter. The various turbines are illustrated and the different features of their construction touched upon. Brief suggestions on the dsign of powerhouse flumes and waterways are given together with a table of power and speeds.

Riveting Machines.—Vulcan Engineering Sales Company, 2014 Fisher Building, Chicago, Ill. Catalogue and two bulletins. The catalogue, which is the fourth edition of the company's No. 3 catalogue and supersedes all former editions describes the various types of Hanna riveting machines and shows their advantages as compared with the hydraulic type. All of the machines are illustrated with both halftone and line drawings. The two bulletins, V-26 and V-31, supplement the catalogue and give some of the results obtained with these riveting machines as well as a partial list of users.

Diamond Drills and Supplies.—E. J. Longyear Company, 710 Security Bank Building, Minneapolis, Minn. Pamphlet. Covers an extensive line of diamond drills and supplies. Practically all the different styles of drills are shown and in addition there is a price list of the various machines and supplies. An extensive index renders the finding of any desired article a comparatively simple matter.

Power Plant Apparatus.—Green Fuel Economiser Company, Matteawan, N. Y. Catalogue No. 145. Describes briefly the products of this company which include fuel economizers and their coverings, mechanical draft, heating, ventilating and drying outfits, hot blast heaters, fans and blowers of all types and engines. A number of illustrations of the apparatus and installations are included.